COMPUTERWORLD

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IBM earnings plod ahead, but analysts see silver lining in Silverlake, Page 145.

Lotus exercises damage control, but big users don't seem upset by another 1-2-3 delay. Page 15.

3Com first to ship what Microsoft hopes will be a boatload of LAN Manager products. Page 4.

Joint Intel-Siemens venture brings first products to market. eyeing federal dollars.

Don't drop that VAX! Is isn't under warranty anymore, Page 14.

DPMA takes out the polish, tries to buff tarnished image. Page 107.

A little knowledge can be dangerous, managers find, as they cope with poorly constructed end-user programs. Page 43.

Accounting stages a comeback with a spate of uts. Page 27.

Jobs III: Next wins early fans

BY JULIE PITTA

SAN FRANCISCO - A college dropout last week unveiled what y be the most inne station yet for the univer-

Steve Jobs, who was instrumental in developing the Apple Computer, Inc. Apple II and Macintosh computers, ended three years of anticipation when his company, Next, Inc., intro-duced the Next Computer System. The black-magnesium-housed unit is a Motorola, Inc. 68030-based workstation run-ning the Unix operating system.
On a stark stage in an auditorium here, Jobs spent nearly two Continued on page 8

AT&T counterattacks on Unix

Leads gang of System V backers in surprise bid to unseat OSF standard ment tomorrow supporting AT&T's Unix System V and detailing plans to form a rival group of System V backers.

AT&T is also expected to an

ounce that it is creating a Unix atware group separate from its

hardware operati

BY AMY CORTESE

In an unroreseen move to counter the Open Software Foundstion, AT&T and several Unix System V licensees are ex-pected to issue a joint announce-

tish a rival Unix group after fail AT&T will with OSF



The move manus an accura-shift in the negotiations between AT&T and the OSF, which had progressed to the point two weeks ago at which AT&T was considered a hairbreadth away from joining the OSF. While the talks have not bro-less off, AT&T is now requiring a condition of its membership ns to central or to come to terms stem V be sub IBM'a AIX as the OSF's core op-

rating system technology. System V issue remains the ma-pic obstact to on agreement. Both sides said they are still talking, but ATeT membership in the OSF seems less likely to-day than it did a short while ago. In meetings held lists week at OSF's headquarters in Law-rence, Mans, high-level repre-sentatives from both camps pre-sentatives from both camps are-evated their sushware of the

ise control of System V its Data Systems Group.

sentatives from both camps pre-scrited their analyses of the technical merits of the respec-tive Unix versions — AIX and System V. Predictably, and AT&T camp praised System V and OSF officials Insided AIX, acvices Co. "I just went through a budget crunch period and wish I had had them." had had them."
However, Mattera expressed concern that such products would present a "garbage-in, garbage-out" problem. "The hu-Continued on page 145

and USF officials issued ALIA, ac-cording to a source who attended the meeting.

"The kernel of Unix has to be System V, Release 4. That is the Continued on Juge 6

Shortcutting net guesswork

BY ELISABETH HORWITT

UNIONDALE, N.Y. - Attendees at last week's Communica-tions Managers Association conference were cautiously enthusiastic about a new breed of simulation and modeling tools that promise to help them come up with hard numbers for prosed network installations.

Recently announced simula-tion tools from IBM, Network Equipment Technologies, Inc. and Make Systems, Inc. reportedly allow users to perform what-if analyses in order to evaluate network response time, fail-ure rates and costs. Such offerings could be used to either design a network from scratch or try out the effect of network changes before actually making m, vendors said.

us, particularly if they showed

and then having to tear it down," said Anthony Mattera, CMA president and manager of net-work planning at Prodicy Ser-

WALL STREET REBUILDS

The harsh lessons of Black Monday

BY ALAN J. RYAN and JEAN S. BOZMAN

une world's attention was riveted on Wall Street, where the Dow Jones industrial average was suffering the most devocativing baseling in it historical variety process of the constant of the tating beating in its his

computerized program trades added to the burden by send-ing sell orders for bushets of stocks that had reached a minimum price threshold. When the market closed, the Dow Jones industrial average stood 508 points lower than it had the previous Friday, and fears of a modern-day Great Depression ran rampant.

BERIIS

It has been a year of healing for Wall Street. Computer sys-tems, which took much of the blame for the Crash of '87, ive been built up, broken own, poked, prodded and inhed to the breaking point. With new computers and

ust happened to the syste

one reason computers cre-ated a bottleneck last year was that the trading came in bursts, rather than in a steady Continued on page 142

See pages 142 to 144 for



SECOND CLASS MAIL

IN THIS ISSUE

DEC masks price hikes . . . Restructured hardware support program will wind up costing users an estimated additional 6% to

9%. Page 14. ... as DG trumpets freebies. New MV/40000 models now sport the added perk of a year's free maintenance. Page 19.

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out of crime

MICROCOMPUTING

end users can be pains in the

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proprietary support.

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MANAGEMENT

107 The new year begins today for floundering DPMA

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chief compares work with

Quotable

"W e're not going to get together in this room again."

JIM MANZI LOTUS

agement as too concern.

4 Prime crystallizes hold on No. 3. CAD/CAM/CAE spot with Calma purchase. 4 Rumors percolate that IBM has disaster recovery up its sleeve.

4 LAN Manager cele-brates firsts from 3Com and DEC support boost. 6 Lap of hazury: Compaq ices long-anticipated

8 IBM plans to add Next graphical interface to AIX. 8 Sybase's Next move is to bundle free copy of SQL Serv

8 Upcoming Evans & Sutherland super to run Next's Mach system.

10 Bin enters botter's NETWORKING ox swinging for U.S. govern-59 ISDN is going nowhere without application sium attendees say 15 Lotus addresses 1-2-3 59 Some users are dubi-ous of IBM, DEC professed

holdup while users hunk down for the long haul. 16 DEC deals with CA to develop VAX/VMS versions

16 The FCC orders carri-ers to justify strategic pricing.

18 New software a tion to fight pirates and trade

18 IBM peddles PS/2s in Hong Kong that failed to meet FCC approval. 19 Masstor positions lat-est tape subsystem as rival to

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145 IBM comes through on SNA software obligation 145 IBM's meager thirdquarter earnings growth is offset by orders surge.

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COMPUTER CAREERS 124 It's still a seller a market for DEC pros. but es

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ing are symptoms of deep troubles. By Asher Yuval.

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know what SISP is, and they 115 Lecht has the results of the Financial Olympics.

DEPARTMENTS

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146 Inside Lines

Inmate tattles on fed prison pirate program which published his letter July 3

Much of the software [that was copied] came from the very

The

same companies that I was ac-cused of defrauding by ordering software on credit and not pay-ing the bills," he wrote. "Who is

News-Times triggered an inter-

crime had been committed after

craims has seen committee uses reading the documentation of some of the programs in which it was indicated that making back-ups or working copies of certain

programs was pern

the greater criminal?" Starchild's letter in

tions on July 5. "There was copying but it was not illegal," said Craig Apker, executive assistant to the warden and public information officer at the Federal Correctional Institution in Danbury. "We checked with the company that published the software and

BY MICHAEL ALEXANDER

Adam Starchild figured his crimi-nal career had ended when he was convicted of mail fraud and sent to the Federal Correction Institution in Danbury, Conn.. oury, Conn., in August 1986. But for nearly a year, he was directed by officials the law instead of rocks, Starchild alleged in a recent tele phone interview.

According to Starchild, he ade as many as 100 illegal duplicates of copyrighted Apple Computer, Inc. Apple II-comput-ble software for use within the correctional institution for ctional institution, for oth stitutions and for the per nal use of prison staff mem-ra. All of the software that he pied, Starchild said, was in-

Prison officials ackr rrison otnicials acknowledged that innates and staff members are copying microcomputer soft-ware and that the practice con-tinues. But they deny doing any-thing illegal, claiming that they are merely doing what the docu-mentation supplied with some corporation (seemes them to do.

ided for use by immates in the

Claris, mentioned by Starchild as one of the companies whose software he claimed to have copied, was unavail

on literacy instructor at the on, said that from October

legal problems stemming from duplicating copyrighted soft-ware. "I pointed out the litera-ture citing availability of a site li-cense from MECC, for example, but [prison staff in the adult edu-cation program] told me that they did not need to buy it," Starchild recalled.

'I was outraged at the moral

point of governmental criminality vs. rehabilitation," he said

The issuate expressed his outrage in letters to the editor of Computerworld and The News-Times, a Danbury newspaper,

'My being made to copy di selects the purpose of rehabil

ey didn't ask ollling the bouns archid, who was an adult ed

But at least one company, MECC, said it had not been con-tacted by prison officials nor did it condone unlicensed copying of "MECC offers site licenses to

36 to August 1967, he made ies of software published by ris Corp., Minnesota Educalaris Corp., Minnesota Educa-onal Computing Corp. (MECC) and other companies. He said that he duplicated these pro-rams using unlicessed copies of opy II and Disk Muncher, two opular programs that enable us-rs to back up copy-protected purchasers of its software, large-ly school systems, and that site license allows software buyers to make a proscribed number of copies," said Dale LaFrienz, president of MECC. "The Dan-bury Correctional Institution, iess it is part of the Danbo hool system, which I seriou subt, does not have a site

> ening screens of its programs stain copyright notices, and its ks are copy protected. Apker readily admitted that

pies of software.
"My understar "My understanding is that making copies is OK and that there is nothing illegal about it," Apher said. "We have not been infringing on anybody's copy-right and are looking at it when we are not sure. We have enough coff members that have Starchild is serving a four-year sentence for mail fraud. He had ordered a variety of prod-ucts, including computer soft-ware, by mail but did not pay for

to check it out if they are un Starchild, meanwhile, is serv-ing the remainder of his sen-tence in food service at the U.S. Posterology in Sondatone

OCTOBER 17, 1988

COMPUTER

115 GE Information Services savior to man Prime's

catch up with computer in-

ployers seek more versatili-

146 CIP/PIM software as

serts itself in management in computer-generated draw-

used to be unthi 1. Scot Finnie.

IN DEPTH 97 Many so-called "prob

OPINION &

can say it three times fast.

141 Stocks



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Calma deal roots Prime in CAD/CAM

BY WILLIAM BRANDEL

NATICK, Mass. - Prime Computer, Inc. jumped deeper into the CAD/CAM/CAE market last week when it signed a definitive ement to acquire General tric Co.'a Calma division for disclosed amount.

The acquisition locks Prime's hold on the No. 3 p m locks in tion in the computer-aided design, manufacturing and eng ering market, according to ternational Data Corp. (IDC), Framingham, Mass.-based t research group.

IDC estimates the buyout will give Prime another 2% of the CAD/CAM/CAE market on top of the 11% percent it already

Top of the market IDC reported that Calma pulled in \$133 million in CAD/CAM/ CAE sales last year, with Prime logging \$744 million. IBM and Digital Equipment Corp. are No. 1 and No. 2, respectively, in the

A Prime spokesman said the deal tightens relations between Prime's engineering group and GE's corporate research laborstory. But be emphasized that the timing of the purchase of a GE subsidiary and the replacement

of Prime President Joe Henson by GE'a Anthony Craig [CW, Oct. 10] were totally coincidental.

"They didn't need a GE executive to buy Calma — GE hung up the for-sale sign over a year ago," said David Wu, vice-president of S.G. Warburg U.S.A, Inc., a Wall Street brokerage

Questionable digestion
We said Prime will be forced to
purge some of its own or Calma's overlapping software product lines. He also questioned Prime's ability to digest Cale as it is still reorienting itself after the \$435 million Comp

The Prime spokesman ac-knowledged that some of Calma will be discarded but added that it would be "very slowly inte-

Prime said it plans to continue to sell and service Calma'a prod-ucts as well as deliver Calma'a ed product enhance-

The deal, which will be subject to government review, is exuary 1989, according to

Disaster recovery in IBM future?

BY JAMES DALY

Reports that IBM may enter the rapidly emerging disaster recov-ery business continued to buse through the industry last week and although the firm would no ther confirm nor deny the talk, it was uncharacteristically open to

We would not rule it out. said a spokesman for the Ar-monk, N.Y.-based giant when asked about the possibility of an ing general availability . "Although we do not service. have an across-the-board disaster recovery offering, we've alhelp our customers on an individ-ual basis with disaster recovery planning through our publica-tions and classroom training."

mors that IBM was hatching plans to enter the lucrative field began circulating a week earlier when Soundview Finan-cial Corp. said IBM had sent out feelers to several large custom-ers asking them if they would be

interested in such a service. Under most disaster recov ery arrangements, companies essentially buy an insurance poli-

on a backup computer at a near-by hot site should their machines be immobilized by fire, flood or monthly fees for the service can run as high as \$50,000, de ing on the level of service.

What? Us, compete? A spokesman for Sungard Data vstems, Inc., a current ma ader, said it plans to meet with IBM in the next few weeks to discuss joint disaster recovery-related ventures, but IBM as-

sured that company that it has no immediate plans to become a Sungard competitor. However, when Sungard asked IBM to sign dustry giant refused. Some observers have said that IBM would take a different approach from firms like Com-

disco, Inc. and Sungard if it en-tered the disaster recovery field. Ray Hipp, president of Comdis-co's disaster recovery service. said be has heard reports that IBM is working on a fiber-based electronic vaulting technology, cally sends copies of its data to a chine at enother site

Although the technology ould not directly compete with emdisco or Sungard, it would eve the door open for possible

leave the door open for possible entry at a future date.

The disaster recovery field is certainly rise for picking. Richard Turbox, vice-president of corporate development at Wayne, Pa-based Sungard, esti-mated that the disaster recovery areas in now a \$500 million mar-trated. Additionally, Sungard sales, about half of which come from disaster recovery, nearly doubled in five years to total \$91.1 million in 1967. 91.1 million in 1987.

Rosemont, Ill-based Comrevenue iron computer recovery revenue will go from \$60 million in the fiscal year ended Sept. 30 to more than \$100 million next

west-paracized casemores such as a fire at a telephone switching station in suburban Chicago in May that knocked out more than 150,000 computermore usen 150,000 computer-to-computer connections [CW, May 16] have also helped to feel user interest in the disaster re-covery field.

Manager protocols and inter-faces to be implemented under its VAX/VMS Services — greas-

ing a migration path from the deak top to DEC minicomputers

nd applications.

Microsoft also received an mexmected vote of confidence

from X/Open Consortium Ltd.,

an organization of international computer vendors that publishes specifications for the implemen-

on and portability of Unio

X/Open reported that it has li-

censed the specifications for the Unix version of LAN Manager

— or LAN Manager/X — for possible publication of both the

possible publication of both the system a protocols and applica-tions-programming interfaces. The LAN Manger/X product is being co-developed by Microsoft and Hewlett-Packard Co.

The license agreement could mean that X/Open

would support LAN Mana-ger/X as a Unix industry standard, but one observer

said the announcement was

far from a ringing endorse-ment on the part of X/Open and that standardization talks are still under way be-

tween the organization and ween the organization and Microsoft. LAN Manager also re-ceived a boost from the re-tail side. Egghest Discount Software, Inc. announced that it will sell, market and support 300m² 3+Open LAN Manager through re-

LAN Manager through re-tail and direct corporate

COMPUTERWORLD

Null Margol Alan J. Ryu Amy Cornel William Bren

Mary Green

di Betta, Rerese Chie

us S. Rosman, Parson C EG Nows Service strices A. Gev, Devo

Microsoft wins more LAN Manager backers

BY STEPHEN JONES

BURLINGAME, Calif. - Microsoft Corp. chalked up more support for its OS/2 LAN Manager last week, clarifying its re lationship with Digital Equip ment Corp. and announcing the availability of the first OEM product based on LAN Manager. At its Network Systems Fo-

rum here, 3Com Corp. an-nounced early ahipment of its 3+Open LAN Manager, a network operating system built on LAN Manager. 3Com also unveiled two network man agement programs de-signed to provide network administrators on LAN Manager with advanced resion Corp. acquisition earlier this source planning and securilities.

3+Open LAN View, which costs \$495 per serv-er, and 3+Open LAN Secure, which sells for \$995 per network, will be available in the first quarter of 1989, a 3Com official said. Both products take advantage of LAN Manager's in-

terprocess communication, called "Named Pipes," that shuttle communications be-IBM currently

Pipes with its upcoming LAN Server, 3Com Chief Executive William Krause said be believes IBM might soon change its posi-tion on supporting the critical networking feature. "IBM prefers to be right rather than consistent," Krause said Beyond the 3Com roll

which were expected [CW, Oct which were expected [Lw, Oct. 10], LAN Manager also received a boost from DEC, which said it is finalizing its plans to license the OS/2 LAN Manager technol-ogy. DEC'a plans call for LAN

On the offensive Old the Otteristee

3Com has signed on to Microsoft's LAN

Manager in kopes of improving its

competitive position against Novell PERCENT MARKET SHARE BY INSTALLED YEAR END 1987



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—Charlotte Walker

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Lexpect they will shortly evolve this architecture to the point where it is CPU independent. And they will be able to port it from the VAX to any other platform with full power and functionality intact."—Michael Braude

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H. Michael Braude, V.P. and Director, Software Management Strategies, Gartner Group, Inc.

NEWS SHORTS

Sun raises prices across the board own rotes prices coross the board Sea Microystems, inc. law week hild option on its workstatement and servers by an average of 7%, bluming increase in the price of memory components. Prices for an average odder, shall prices for older systems have been bounded by between 10% and 15%. Additionally, Sea raised prices for add-on memory by \$100 per imagi-type. This is the condition Shall be shall be

ADR acquisition a done deal

rature, acquisition a done deal
Barry's a month after the feel was anomored. Computer Autocomputer Auto1997 and Auto1997

Cadnetix resists suitor

The stage is set for the computer-aided design and manufactur-ing industry's second housile takeover battle of the year. Cad-netix Corp., strongly urged its shareholders has two sets to reject Dainy Systems Corp.'s \$8 per share tender offer [CW, Oct. 10]. Boulder: Colo.-based Cadnetic allow went to court to seek vali-dations of its defensive shareholder rights plan and an injunction inist Daisy's attempt to consummate the tender crently owns 7.6% of Cadnetix. If successful, the ald put Daisy among the top 10 CAD/CAM vendor nate the tender offer. Daisy sful, the takeou

What's in a name?

When a lot, longing from Arthur Anderson & Co. 2 docision last week to give in consulting practice a new mone. Anotherson last week to give in consulting practice a new mone. Anotherson active and the second practice and the second practice and the second practice and the second practice and the second practice. The company would not comment on the operation but soil it has already would not comment on the proculation but soil it has already would not comment on the proculation but soil it has already active and the second practice. The company would not comment on the proculation but soil it has already active and the second practice.

ructuring the practice. "In Consider an accounting firms have been taking a strain between the softing and consulting practices, artiser this year, the consulting arm of Chicage-based Arthur coung was form apart when senior partners broke away to rm Technology Solutions Co. (CW, June 20).

Thanks for the memories

Japan's leading semiconductor makers plan to raise their prices for 1M-bit dynamic random-access memory (DRAM) chips on, according to Japanese press reports. Fujitsu Ltd., Mitsushi Electric Corp. and Toshiba Corp. are among the composhi Electric Corp. and Tonhiba Corp. are among the compa-siplanning to raise prices from the \$11.62 to \$17.69 term is month to the \$15.38 to \$17.69 per chip level for large-vol-ne customers. Even though production of 1M-bit DRAMs as boosted in July, suppliers expect the tight supply-and-de-and situation to continue for a while.

GE sheds another unit

GE sheds another unit General Betric Co, demonstrated list wook that it is cager to sell off information systems subsidiaries. Scorty after an-sonouncing that Prince Computer, Inc. will byte is Claim subsidi-ity (see story page 4) GE sold its Deptial Virso Interactive Technology Venture (UPV) Betrility to leter Corp. Intell gains the Princeton, NJ-based Beality 43-5-person development I team from the deal as well as UV's proprietary digital compression and decompression technology, patents and hardware and self-ware products. DVI products are used for interactive, fails motion video and audio capability in personal computers and

Compaq laptop lives three-hour battery life

BY JULIE PITTA

HOUSTON — Compaq Com-puter Corp. today will introduce an Intel Corp. 80286-based laptop computer that is able to op-erate on batteries for an estimat-

be introduced at a press confer-ence in New York, is one of a month in the resurgent inptop market. Other models have re-cently been introduced by NEC Information Systems, Inc., To-shiba America Corp. and Grid Systems, Inc. A laptop announcement is also expected

According to Computer Intelence, a San Diego market re-arch firm, Toshiba and Zenith Data Systems are the market

are leaders in that arens. Industry analysts have said these systems are growing in popularity for corporations with field personnel because of their

sticking point," said Robert M. Kavner, president of AT&T's Data Systems Group, in an inter-

view with Computerworld last week. AT&T, along with 10 oth

er companies now shipping Unix System V systems, will form a group to counter the influence of

Kayner indicated that keep ing System V intact was a

demand coming from its prospective users group.
"That is what the 11

companies are insisting on for them to join [OSF]," Kavner said.

Kavner would not identi-

fy other members but suggested several ven-dors as candidates for

such a group: Amdahl Corp., Unisys Corp., Control Data Corp., NCR Corp., Ing. C. Olivetti &

All of the com

built multiyear

Fujitsu America, ICL Ltd., Gould.

AT&T

FROM PAGE 1

OSF, he said.

"You have to give Toshiba a lot of credit for demonstrating that the market is there," said William Zachmann, president of Canopus Research, a computer industry research firm is Dux-bury, Mass. "That's money that

Compaq has been leaving on the table. It's safe to say they'll get their share of it now." The long-expected Compactry, called the SLT/286 entry, called the SLT/286, weight 14 pounds and measures 13½-by 8½-by 4½. It runs at a 12½-MHz clock speed and offer 640K bytes of random-access memory, expandable to 3.6M

The inptop also feats expansion slots. The 10-in. flat-panel display is backlit and offers 640- by 480-pixel IBM Video

osu- ny 480-panet and Video Graphics Array resolution. The system is powered by a bettery pack said to provide an estimated three hours of use. An AC adapter is also standard. in two versions, one with a 40i byte hard drive priced at \$5,9 and a second with a 20M-by hard drive priced at \$5,399.

4 x 13% x 8% is

It's a laptop

Con SLT/286

pag's long-awaited able runs for three hours or arreable batteries

12-MHz inte 80C286

they're going to have to put a ton of money to get themselves on AIX," he said. In a subsequent teleconferations even more than he did to the conclusions the OSF eventu-

In a subsequent teleconter-ence last Thursday originating in Summit, N.J., AT&T called for a incredibly important deci-n," Kayner said. "If we're all going to follow OSF, shouldn't we all be satisfied that we've got the world's best making this departicipate in a joint anparticipate in a john au-incement Tuesday stating port for AT&T's Unix Sys-They are moving so by that I am concerned tem V as the industry-standard

Karrner: If we're all going to follow OSF, shouldn't we all be satisfied that we've got the world's best making this decision?"

mation of a rival group backing mation of a rival group backing.
Unix System V.

The move led by AT&T to stand behind System V is admittedly a little late, Kawner conceded. "I don't think we've done a good public relations campaign understanding what OSF realty is," Kawner told Computerprograms around System V and would have to invest millions of dollars to retrofit systems to a new standard such as IBM's AIX version of Unix, according to Kavner. "What they worry about is that if OSF adopts AIX,

sut the quality of this decis y're making." OSF has accepted 23 submissions for the OSF submissions for the OSF system's graphical uses AT&T's own Open Loo interface. Kavner is con cerned that Open Loo

cess is an honest one.

Like many user
Gery Biddle, vice-predent of information sy
tems at American Stadard, Inc., express Two years is forever," he I When faced with a business blem, American Standard's

olicy is to go ahead with what is valiable and not wait for a stan-Miduest Bureau Chief Jean Bozman and Senior Writer

VMCENTER II Smart Economics.



ities simplify data center administra-tion while keeping a watchful eye on system usage and costs. No wonder Pioneer regards VMCENTER II as a major systems management asset. And an excellent investment in total data processing performance.

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capability and proven timesawing
features, VMCENTER II is the most

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than ever.

Whether it's adding new users, scheduling off-peak production, or reducing minidisk clutter, VMCENTER It's comprehensive facili-

IBM hops aboard the Next train

BY J. A. SAVAGE

IBM grabbed a piece of Steve Jobs' limelight last week and at he same time raised questions bout its own intentions for its

Just four days after an ing that its AIX operating sys-tem for the Personal System/2 line would be delayed five months, IBM said it would lise Next, Inc.'s graphical in-ace and add it to AIX.

Nextstep, application-devel-opment and end-user interface software, will be available on IBM's PS/2, RT, 370 and future reduced instruction set comput-ing systems, according to Bill Fi-lip, IBM's assistant general manager of personal systems. No date has been set for product bility, according to an IBM

spokesman. Nextstep has four parts: Win-dow Server, which manages on-screen image drawing: Applica-tion Kit, with predefined objects to replace subroutines in applica-tion development: Objective-C, an object-oriented version of C

Johs

FROM PAGE 1

tion kit; Interface Builder, which uses the objects in the Applica-tion Kit to structure the applica-tion's interface; and Workspace Manager, which shields users Unix commands with

How to tell them? IBM will now face the ou of explaining to users the differ-

of explaning to users the differ-ence between the Next interface and IBM and Microsoft Corp.'s OS/2 Presentation Manager in-terface set for shipment later this month. Presentation Manager will run on the PS/2 line, but IBM has never committed it-

self to implementing it on AIX.

But while there may be some initial confusion, there is little overlap between the two syss, said Adrian King, director of product marketing for operat-

King said AIX is aimed at gov-ernment and education bids, while Presentation Manager is meant for more general produc-tivity applications. He added that Presentation Manager will be the basis for IBM's Systems Apcation Architecture interface.

Users, however, may turn blue holding their breath before s product is available. IBM ap-pears to be having problems shipping its own Unix systems, even without the addition from Next. IBM said earlier this month that it will delay initial penents of its AIX PS/2 oper ng system until March 1989 Senior Editor Douglas Bar-

ney contributed to this report. served as the system's equiva-lent to the Macintosh's trash can

icon. Using a mouse, a file was

sent to the black hole, which

posed of the file. A jack in the back of the base accommodates

may have erred by not using the

ular reduced instruction set

miniature stereo earphones. "It's a very impressive ma-chine," said Richard Edwards,

SQL Server bundled with Next

BY DOUGLAS BARNEY

High-flying Sybase, Inc. has stuck another feather in its cap in the form of a bundling deal that of SQL Server with every ma

ine they purchase. If Next attacks the co cial market, the bundling deal may cut some of the muscle out of Sybase's deal with Microsoft Corp. and Ashton-Tate Corp. to resell an OS/2 version of the

me database engine. There will be some competi tion for the hardware and operating systems sales between the Next and OS/2 versions, Sybase

President Mark Hoffman said. But most shops have already de-cided on a hardware platform and will not make the switch be-cause of a bundling deal, Hoff-

Not equal yet in addition, the version of SQL Server bundled with the Next machine supports fewer users and networks than the OS/2 version. Once the Next version is upgraded and given parity with the OS/2 version, the price will be increased and will be similar to the OS/2 version, Hofiman

Microsoft downplayed the SQL Server competition from

Next. According to Adrian King, director of product marketing for operating systems at Micro-soft, the decision to buy a Next machine instead of an Intel Corp. 80386-based machine for OS/2 will come down to the overall se-ection of applications, not just

lection of applications, not just SQL Server.

No matter what way people chooseto go, there should be some measure of compatibility between the two products, ac-cording to Ring. "There will be overlap in the sense that (Next). is licensing the same technology. But, at least applications-wise, there will be a lot of compatibillicensing the same tech ity between the products,"

cessing supercomputer based on the Mach operating system in mid-1969, and Vice-President of Marketing Bob Stevenson. He said Mach, which is based on the University of California at Berkeley's Univ. 43, has extensions that allow high- and graphics applications to be processed on a specified processor in the as it brings multipro

publities and memory management to Unix's sometimes loose processing structure.

Mach is also reportedly 15% to 30% faster than standard ver-

sions of Unix because of its tighter degree of ghter degree of organization, aid Rick Rashid, director of the said Rick Rashid, director of the Mach program at Carnegie-Mel-lon. He said that Mach easily out-performed Sun Microsystems, Inc. 's SamOs 3.5, Digital Equip-ment Corp. 's Ultrix-32 and IBM's ACIS in benchmark tests. Mach also brings additional virtual memory management percomputer. Carnegie-Melion Universi ty's computer science depart-ment has developed and is shep-herding Mach, which consists of

a rewritten kernel inside the Unix external interface. The that is useful in high-end grap ics applications. system may open application doors previously barred to Unix,

Mach getting up to speed BY WILLIAM BRANDEL

The Mach operating system on Next, Inc.'s workstation may have made its debut playing a desktop role, but its capabilities will be exploited in a grand fash ion when Evans & Sutherland Computer Corp. raises the curtain on its next supercomputer.

Evans & Sutherland will introduce a \$5 million multipro-

computing architecture, which offers better price/performance for future systems; by failing to detail a networking strategy; and by creating its own window system rather than adopting a standard such as X Windows. 'Most Unix-based softw developers will write for X Windows." Edwards said.

an analyst at Robertson, Colman & Stephens in San Francisco. However, Edwards said Next The price is right Perhaps the loudest applause came at the announcement of the Next workstation's entry-

vel price of \$6,500. ut Jobs then quickly delivered what attendees said was the biggest letdown of the day. The only way to get a Next workstation - as lobs out it - is to "enroll" in a university.

The system, which is sched-uled to begin shipping next month, will be sold directly to

colleges. Universities may in turn resell it to students, al-though it is unlikely that many students will be able to afford the system. The machine will likely find a home in research branches of large or well-funded schools. Next was mysteriously secre-

tive about the machine, cordon-ing it off behind rope barriers and permitting only one photog-rapher in the auditorium. Re-porters were later allowed to

CF CHART

ext, inc.'s personal computer, three years in the making

but no views of the screen w

In an interview after the press conference, Jobs insisted that universities can afford the system, although public institutions are especially hampered by tight bedgets. "I think you'll see a lot of these machines in state institutions," be said. "We've

institutions," be said. "We've done our homework."

Few believe that Jobs will limit Next to the university market. The new Steve Jobs who emerged after nearly three years of being out of the limelight speared to be a more savry businessman than the brash Jobs of the Apple era. He discarded the lowest of the neast and see the lowest of the neattern boasts of the past and seemed unwilling to set grandiose goals. "More companies tend to die

If Next does indeed branch out into consumercial markets, as industry watchers expect it will, the system represents stiff con-petition for Jobs' earlier brain-child, the Macintosh, and for San Microsystems, Inc. products. Officials at both companies emplayed the potential co

petition.

"We like innovative technology; we're all for it," an Apple apokeswoman mid. "And as a company, we wish Steve we'l.

But we're confident in our technology. We're not standing Marlene McDaniels, director of marketing for Sun's education line, called the Next machine "s

very good machine. But we didn't think it's particularly rev-These are tech ogies that Sun is using. We not standing still either."

Applause was stored in the system and replayed to show-case the system's sound capabili-ties. An animated black-hole icon

hours last Wednesday demon

hours last Wednesday demon-strating the computer to an audi-ence of about 3,000 veterans juded from many other "revolu-tionary" introductions. After-ward, many voiced high praise for the machine.

For students only? aches high-end workstation sower Next's computer system approace for the price of a fully loaded PC 25-MHz Motoroin 68030 and 68882 floatis point processors; 10-MIPS Motoroin 56001 Dietral Signal Processor

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Operating system	Unix-based Mach
Bundled applications	Word processing; symbolic mathematics; database; LISP language; personal text databas manager; electronic mail with integrated voice mail
Date:	80 500

World Records

VAXVMS 49

MS 49 tp

ORACLE* sets world performance record 265 transactions per second

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environment. Using industry standard benchmarks, ORACLE set
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VAX minicomputers running UNIX.
and minicomputers running UNIX.

ORACLE set the world record for performance by running 265 transactions per second (tps) on a 3090-600E class Amdahl* mainframe running the IBM MVS operating system. This breaks the old record of

240 tps set by a cluster of 16 Tandem computers. ORACLE also set the

record for DEC minicomputers by maning 40 yes on a VAX C40 naming VMS. This breaks the pervisos VAXVANN record of 22 ups et on a VAX 8700 connected to a VAX 8800. ORACLES results were audited and verified by the Codd and Date Consulting Group. And not only is ORACLES performance nearly twice as fast as this previous record, but ORACLES cost per transaction is almost four times better than that of the other system. ORACLE set a UNIX record of 124 tps on a large minicomputer from Sequent as well. Once again, the results were independently verified by the Codd and Date Consulting Group.

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Biin aims first products at fed market

WASHINGTON, D.C. - Biin, the internal computer systems company ed by Intel Corp. and Siemens AG in July, has set its sights on the U.S. governarket with a proprietary computer chitecture that em e, security and the Ada programming

Last week, Blin (rhymes with fine) unveiled the first two systems in its product family as well as its federal marketing ef-fort and an alliance with Relational Techogy, Inc., whose Ingres database man-ment system will be integrated with 's architecture

However, Bin did not announce any ations software for the new sysss. The company said it is working on a other of alliances with OEM companies

vertical-market applications. Although Biin is aiming initially at the U.S. government and European factory automation markets, other potential mar-kets include financial services, on-line

transaction processing, manufacturing, telecommunications and health care, offi-

available products before it became eligi-ble to hid on U.S. government contracts. Company officials indicated they expect

work mratily. Bin's competitors include such major players as IBM, Digital Equipment Corp., Tandem Computers, Inc. and Stratus Computer, Inc. But Joseph J. Kroger, form Unsinys Corp. executive and now president of Bin. said Bin will have a competitive edge became its systems of fer built-in society, adjustable levels of tolerance and lower prices due to

manufacturing efficiencies.

Because Biin is the product of a five-year research effort by Intel and Siemens. Kroger called the joint venture a mature start-up that has 300 employees, expen-ditures of \$150 million and an internation al network of ser

Bucking the trend In an interview, Kroger acknowledge

that coming out with a proprietary archi-tecture runs counter to the trend toward open systems, but he stressed that Bin's hitecture has interfaces to AT&T's Unix System V and the IEEE Posix stan

rd for applications portability.

Although the operating system is pro-ietary, Bin/OS has a Unix shell that will w software vendors to port their Unix plications software to it, said Adam shoey, an analyst at Kidder, Peabody &



Co. in San Francisco. "The hardw

ere, but you've got to convince the software writers they should port to you vs. someone else," be added...

someone elec," be added.
Bin announced two systems, the entry-level Bin 20 and the high-end Bin 60,
and claimed that they have better price/
performance ratios than DEC's Microway.
The Bin 60 can be configured with two
ceight processors with performance of
11 million instructions per second to 44
MPS and was designed to support about
1,000 terminals. The system, available
incondistable in price of from 23.65.500 to ediately, is priced from \$345,500 to

\$315,000. The Bim 20 is a deaknide or deaknop package with one or two processors that was designed to support 50 terminals and has a performance range of 4.5 to 9 MIPS, the vendor said. The price in \$43,500 to \$75,000, and volume ship-ments are expected in March 1989. The key to Bian's 32-bit multiproces-

ser to Bin's 32-bit multiproces-sor architecture is that many functions typically found in systems software are embedded in the very large-scale inte-grated chips provided by Intel, officials said. Key features of the architecture in-clude the following:

clude the following:

• All systems in the product line can run

ads to select three levels of fault tolerance in order to achieve de

performance levels; is provided with ac-cess controls for users and hardware-en-forced controls for programs. Bin said it expocts to get a C-2 security rating from the government's National Computer Sethe government's National curity Center early next year.

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Want a free warranty? Don't go to DEC

Revamped support program eradicates freebies, effectively hoists hardware prices 6% to 9%

BY JAMES DALY

MAYNARD, Mass. — Digital Equipment Corp. effectively raised its prices by an average of 6% to 9% last week when it announced a gutted and rebuilt warranty program that eliminates a free year of ance service.

The warranty changes are effective ately and will be expanded to DEC's international market next year. John Buckley, DEC's manager of U.S. tration, said the company

had originally toyed with the idea of raising prices across the board but opted for the warranty action because "it does give mer some choices

A price increase may also have soured sers, who absorbed a 3.5% price increase in June that DEC attributed to the rising cost of dynamic random-access

The Columbus dodge
DEC downplayed its decision to abandon
the formerly highly touted program, slipping the announcement under the door
during the Columbus Day holiday and laling the development a move to let cusrs choose "their appropriate level of

oduct support Under the new plan, warranties are available in four forms: list-price, basic, standard and optimum. Services under the new options are broken down as fol-

. The List Price Warranty is included with all systems and was primarily designed for customers prepared to handle the lion's share of their maintenance. Free service is available to customers who bring their computers to DEC ser-

. The Basic Warranty is a nine-hour-aday, five-day-a-week plan that includes access to DEC's software information database, the right to use new versions of DEC's software, on-site software support, full hardware installation, 24-hour ephone support and a four-hour re-

sponse time.

The Standard Warranty, which DEC is ng the hardest, essentially soups up the previous free one-year warranty. The Standard Warranty services are identical to the Basic Warranty with the exception of offering 24-hour-a-day, seven-day-aweek on-site support and a two-hour re-

The Optimum Support Warranty in-cludes all the features of the Standard Warranty and throws in a professional support engineer for six months and a performance optimization service to proum Support Warranty in vide performance upgrades.

Because of the changes, users can ex-

Because of the changes, users can ex-pect to fig deeper into their pockets to obtain the equivalent level of service pockets to obtain the equivalent level of service pro-tection that was offered earlier at no charge. A four-user Microvax 2000 that had sold for \$18.800, for example, will now be available for \$20,000 with the Sundard Warranty. Buyers of the high-end Microvax 8840 systems, on the other hand, should start hunting around for an extra \$100.000 to cover the cost of Stanrd Warranty protection for the \$1.3

DEC said it expects 60% to 70% of its

customers to choose the Standard Warthird-party maintenance competition and ranty coverage and 10% to 15% to take advantage of the free List Price Warran-

Early bird gets the warm Although the new arrangement goes into effect immediately, orders placed before

the announcement will enjoy whatever warranty was provided at the time of sale. Analysts reacted favorably to the move, noting that the free warranty was begun 18 months ago to squeeze out

was no longer finan "Customers must face the fact that

they are either going to pay maintenance costs up front or wendors will tack it on to the product price," said Barry Bosak, a securities analyst at New York-based Eberstadt Fleming investment firm. Eberstadt Hemmig unvestment mrm.

Others argued that the price increases are extreme because computers have become increasingly reliable in recent years and the need for service has been reduced. "I think it's outrageous," commented Scott Magoon, director of aca demic and research computing at Brandeis University in Waltham, Mass. "Their high maintenance costs have al-ready forced other departments in this university to go with other vendors, like

Hawlett Pack Immically, as DEC scaled back on its in cluded warranty offerings, fellow Massa-chusetts organization Data General Corp. added product support muscle to its re-cently amounced high-end MV/40000 and MV/40000-High Availability procesor line with the addition of a comprehensive one-year support package for the ma-chines and their related family of products

(see story page 19).
DEC also said it will increase prices of

Direct Access To All Your **ComputersWith** INGRES Relational Database.



Hurry-up-and-wait mentality strikes again with 1-2-3

BY MICHAEL ALEXANDER

CAMBRIDGE, Mass. - While Lotus Development Corp. executives scrambled last week to explain why 1-2-3 Release 3.0 would be delayed by as much as six months, users by and large said they are still willing to wait.

At a hastily called Columbus Day press derence, Lotus executives conceded that they had overestimated the enormity

of the task of developing the product. W. Frank King, senior vice-president of the software products group at Lotus, said the job of developing Release 3.0 turned out to be "an order of magnitude" greater than designing Release 2.01, the current version of the product. Lotus de velopers have written some 330,000 lines of code in C language for Release 3.0, compared with about 100,000 lines

for Release 2.0 written in assembler, be



ond-quarter target to ship the new re-lease is firm and one they are certain can be attained. Jim P. Manni, president and

chief executive officer, added, "We're saying that we're not going to get togeth

saying that we re not going to get rogective ris this room again."

King said much of the difficulty lay in writing Release 3.0 so that it is portable across free operating systems — IBM and Microsoft Corp. 5.05Z, Microsoft's MS-DOS, IBM MVS, VM and Unix — while maintaining compatibility with previous versions of the best-eeling apreadous versions.

The timetable for other versions of the product - 1-2-3/G, a graphics version of

opportunities we've NE OF THE biggest own [for a graphical version of 1-2-3] was in the Macintosh market. But in our core market, the IBM DOS market, we would not change places with anybody." IIM MANZI

1-2-3, and 1-2-3/M, which Lotus is devel oping with IBM for mainframes — is un-certain, although Release 3.0 will provide the core for those and other products,

corran factorin tensor to an investment of the common official and in the common of the com

firmed that view.

The delay is not going to affect the work of most of the more than 1,500 1-2-3 users at The Gillette Co. in Boston, and Greg Chetel, director of systems planning and research. "Most of our users are not pushing the limits of the existing product, and we do not see the delay as a big enough event to consider swit alternative like Excel," he said

Investors were less patient, however. On the day of the press conference, Lotus stock fell by % of a point to close at 15%

stock tell by % or a pount vo. con 2.3 million shares traded.

Robert Schechter, Lotus' chief financial officer, said that the current upgrade program for new buyers of 1-2-3 Reiesse 2.0 will be extended until Release 3.0 is shipped but declined to say how much the



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DEC hooks up with CA lines

BY ROBERT MORAN

NEW YORK — Digital Equipment Corp. took additional steps last week toward its goal of penetrating IBM-ruled data cen-ters by signing a deal with Computer As-sociates International, Inc. to jointly develop and market versions of several CA products for the DEC VAX/VMS environ-

The formal agreement will offer DEC users the Garden City, N.Y.-based developer's systems management software and utilities and open a new and burgeon-ing market for CA.

tegrate more closely into the VAX envi ronment are CA-Netman/VAX (network configuration management), CA-Ar-chiver (resource management), CA-Diss-pla and CA-Tellagraf (graphics), CA-Tellaplan (project management), CA-Strategem (decision support), Ad Lib (query/report writer) and the Master-

piece financial application series. The company said the products have en moved under DEC's All-In-1 and that compatibility with DEC's RDB datase management system will be added to ssterpiece. However, no pricing or silability date was given. In addition, a joint development team will join CA's Su-perimage, a graphics editing system, with DEC's Decwindows. Delivery of that product is scheduled for the first half of 1989.

On the growth path DEC's mid-range market share has climbed steadily from approximately 13% in 1983 to 22% in 1987, according to Steven Widen, program director of Dectrack at TFS, Inc., a Westford, Mass.-based

consultancy. Such growth has enticed several oth

software developers to sign recent ma keting deals with the minicomputer ma ers. DEC and Relational Technology, In are expected to announce such an agree

The alliance will also help DEC per are assume wa amo neep JPE Dent-trate large data centers, said Dale Kut-nick, an independent consultant in Redd-ing, Conn. Missing from DEC's offering has been the utilities that match the so-phistication that IBM and third parties have because to IBM and compared.

phistication that IBM and third parties have brought to IBM environments. DEC also introduced an easier-to-use Version 2.3 of its All-In-1 office system along with the Mailland directory service, which automatically locates recipients of mail on any size All-In-1 system or other X.400 systems as well as IBM's Professional Office System and Systems Network Architecture Distribu-

tion Services.

AB-In-1 Version 2.3 will ship in the fourth quarter of 1988. Prices range from \$7,088 to \$112,219, depending on system. configuration. Mailbus will also available then, and the cost will depend on

FCC rules carriers must justify costs

BY MITCH BETTS

WASHINGTON, D.C. - The Federal WASHINGTON, D.C. — The Federal Communications Commission gave business network managers a partial victory last week when it ruled that local carriers must provide better justification when they use above-cost pricing for high-ca-

During a three-year FCC investigation of the "strategic pricing" issue, business groups such as the International Commugroups such as the International Commu-nications Association (ICA) charged that special-access rates for high-capacity voice and data services are grossly inflat-ed (CW, Aug. 15). The FCC ruled that strategic pricing is not unlawful because the carriers must have the flexibility to consider factors when the control of the control of the control of the other than control of the control of the

have the flexibility to consider factors other than cost when setting special-access rates. However, the FCC said carriers must provide detailed justification for strategic pricing and demonstrate that it meets a set of six guidelines.

meets a set of six guidelines.

"We would have liked to have seen an up-or-down vote on the basic issue, but this is a step in the right direction," said Brian R. Moir, a counsel for the KCA. "We don't oppose flexibility, but we wanted some justification."

Only the right reasons
The FCC's guidelines stated that strategie pricing most advance a specific public
policy goal — such as preventing uneconomic bypass of the public network —
and must not binder a customer's choice of access services, the implementation of new technologies or efficient use of the

Local exchange carriers said they use Local exchange carriers and tuey use strategic pricing to discourage businesses from bypassing their single voice-grade circuits and moving to bundled, high-ca-pacity services, the FCC and. The commission postponed decisions

on several issues until it gets more public comment. Those issues include whether past tariffs meet its new guid whether users are due refunds and s gic pricing of Digital Data Service rates.



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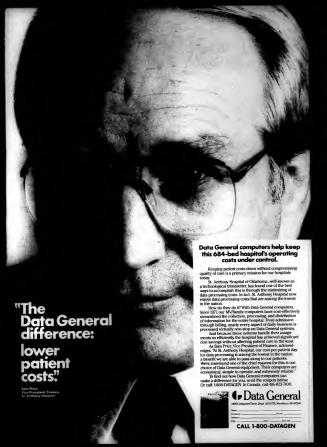
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Software firms unite, aim to keelhaul pirates

BY MITCH BETTS

WASHINGTON, D.C. — Six major soft-ware companies formed the Business Software Association (BSA) last week with the goal of fighting international software piracy and reducing trade barri-

ructure for an ad hoc group of vendors

that was instrumental in several raids against Hong Kong's Golden Shopping Arcade, one of the world's most notorious

markets for illegally copied software. In the latest raid, in July, Hong Kong officials osed down several pirate software out

The founding companies are Aldus Corp., Ashton-Tate Corp., Autodesk, Inc., Lotus Development Corp., Micro-soft Corp. and Wordperfect Corp. The

group, based here, selected attorney Douglas E. Phillips as president. Phillips said formation of the BSA is a response to the enormous losses the soft-ware industry suffers from piracy and de-nial of market access. The U.S. Interna-tional Trade Commission recently reported that 31 U.S. hardware and soft-ware firms lost \$4.1 billion in 1986 due to foreign piracy.

World offers
In addition to fighting piracy in East Asian
markets, BSA is expected to focus on ensuring that the software markets in Europe and Brazil are kept open to U.S.
products.

Phillips said the BSA will lobby the U.S. and foreign governments, work with

HE U.S. International Trade Commission recently reported that 31 U.S. hardware and software firms lost \$4.1 billion in 1986 due to foreign piracy.

law enforcement agencies, pursue private lawauits, conduct educational programs and work with estitute trade associations. For example, the BSA recently urged the European Commission, which is studying intellectual property rights in Europe, to provide full copyright protec-tion for computer programs in a forth-

Offshore only
Phillips said the BSA will not work on domestic piracy cases, leaving those to
Software Publishers Association (SPA)
and ADAPSO, a computer software and
services industry association.

services industry association.

BSA organisers denied that the forma-tion of the new group is an implicit criti-cism of similar activities by the SPA and ADAPSO. They said the BSA will work closely with the two older associations in

closely with the two units. Second international affairs.

"It's just a difference in focus," said R. Duff Thompson, speeral counsel at Wordprefect in Orem, Utah. "Our goal is to keep the group small, with a focus that is now and internate."

Unmodified PS/2s overseas

BY CHRIS BROWN

HONG KONG — IBM is selling un

NUMBER ADMONSTRATES AND ASSESSED The firm was required to modify these sachines in the U.S. to correct a poorly

machines in the U.S. to correct a poorty placed keyboard cable.

The FCC regulations do not apply in Hong Kong. However, in order to meet the regulatory board's rules, IBM has taped over the FCC specification stickers on the backs of all PS/2 Model 30 285s exported for sale here, according to Ray Gorman, a spokesman for IBM Asia, South Pacific.

No contact yet
Gorman also claimed that all IBM dealers
and distributors have been told to inform
customers that the machines do not comply with FCC regulations.
However, none of the IBM dealers
contacted said they had heard from IBM
on this matter. All of the dealers declined

to be named.
One dealer said, "I got the stock only a

One dealer said, "I got the stock only a couple days ago, but there's been nothing about this [PCC] at all."
At an unspecified date, IBM Asia/South Pacific plans to affix all Model 30 286s and in Hong Kong with a device to make them PCC-compliant, according to Hal Jeneings, marketing program manager at IBM Asia/South Pacific.

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Masstor pits tape against disk storage

BY J. A. SAVAGE

SANTA CLARA, Calif. — It may be bins-phemous, but Masstor Systems Corp.

puemous, but Masstor Systems Corp.
says its new tape subsystems can compete with disk storage.
Two IBM-compatible tape storage
systems, both using belical scan recording
technology to pack in a terabyte of data per system, are being announced today by Masstor. One has a footprint smaller on measure. One mas a rootport similar than a refrigerator's; the other's is the size of a moving van. Both are intended to take advantage of IBM's MVS/ESA Sys-tems Managed Storage capability. The M960 Mass Storage System, set

ullet-shaped cartridges about 31/2 in.

NE SYSTEM has a footprint smaller than a refrigerator's; the other's is the size of a moving

long. The system consists of a controller and a storage module for up to 316 tapes at 350M bytes per tape. An optional hard-ware data compression facility is avail-able, compressing 700M bytes on each cartridge, according to the company. The tem can accommodate up to eight

orage modules.
Because of its 3M byte/sec. through-at, the M960, with support of 4.5M yte/sec.data-streaming channels, is con-dered on-line, according to Michael moore, senior vice-president of

Masstor adomestic operations.

Masstor doubled the capacity and throughput on the M960, compared with its last product, the M860. The bullet-

for a decade.

The second system, scheduled to be available late next year, should be able to store 31.25G bytes on a tape cartridge that is the size of a portable dictionary at an estimated cost of \$1.25 per megabyte.

Missitor said the M1000 will also have

twice as much data per tape — up to 2 terabytes per module — to be stored. With a single accessor arm, the M1000 aximum access, load and unf time of 9.5 sec. per tape, acco

Masstor officials said the company is announcing the M1000 a year ahead of shipping because of the current availabil-ity of IBM's MVS/ESA Systems Managod

nated storage areas. se M960 is expected to cost ,000 for a basic controller and mod-, with the optional data compression ting another \$125,000. The M1000 cost about \$1,300,000, according to ore. No price has b

DG adds support for MV/40000s

Extensive plan seen as jab at DEC's warranty price hikes

BY JAMES DALY

MILFORD, Mass. - Data General Corp added warranty muscle to its recently an-nounced high-end Eclipse MV/40000 and MV/40000-High Availability processor line last week with the announcement of a The Warranty Service Contract ad

munition to DG's arsenal in its war sinst competitor Digital Equipment rp. The Maynard, Mass., giant began

Under DG'aplan, cu

The coverage als clock remote assis

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stance from DG'a Cus-ster (CSC) in Norcross,



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OF BRANCHES TREE.

a strategy to but which we

FOITORIAL

The Next step

THE QUESTION FOR Next, Inc. is this: Is the industry ready for yet another personal computer? If history is any indication, it is - but

with a catch. Next founder Steve Jobs will find that the market has changed a great deal since he played key roles in creating the Apple II and Macintosb standards. In the Apple II's case, all that was required for

success was an idea, a brilliant technical mind in the form of Steve Wozniak and a retail industry waiting to happen. In the case of the Mac, success required an entire division of Apple, three years of arduous post-release product tuning and refining and a major shake-up of company leadership, including the removal of Jobs himself

For Next, the hurdles are even higher. There is no doubt that the machine the company unveiled last week is revolutionary in many respects. At a discounted price of \$6,500, it comes with memory, storage, graphics and sound capabilities of machines more than double its cost. But the industry is strewn with revolutionary

deas that never made it in the market. The Macintosh itself was a good example. At the time of its introduction, it was a quantum leap ahead of the available technology in ease of use and flexibility. But it wasn't until Apple added 384K bytes of additional memory and a DOS coprocessor board that business users accepted it.

The Mac was a machine that didn't know what its market was. The Apple II didn't care. Neither approach is good enough to win today, so Next has embarked on a strategy that seems to make a lot of sense.

The company is carving out a niche — universities and laboratories - in which it believes price sensitivity and a low degree of vendor lovalty can give it an edge. Next has also added another important element to the equation money. Endowed with a virtual blank check from billionaire H. Ross Perot, \$12 million of personal funding from Jobs and a legion of eager but unnamed investors, the company is approaching the market with resources to burn. Next should resist the stomping that less fortunate start-ups often suffer at the hands of the big boys.

But what will make or break Next will be its ability to rise above technological arrogance and respond quickly to customer needs. The company has taken a number of gambles with the Next computer; the machine is priced well above the means of most university students, it won't accept a floppy disk and it has no PC compatibility. Let history be a warning: Apple's stubbornness in the face of demands for expandability and IBM compatibility on the Macintosh nearly killed that product three years ago. Ironically, once Apple gave in and offered a PC compatibility option. the issue died and the option never sold.

It would be shortsighted to think that Next will limit its horizons to students and engineers. If the company is to become the billion-dollar giant it envisions itself to be, it must vie for the corporate market. The interest will be there, but only if Next is tough enough to compromise.



LETTERS TO THE EDITOR their rationale will reduce the complexity of the problem. I fail to see how the up-front develop-

Creativity matters I must take exception to an arti

cle concerning "business eti-quette consultant" Ada Barnett ICW. Aug. 151. Barnett proposes m ble solutions to problems encountered by high-level manage-ment and marketing personnel.

But please keep her away from working engineers! The waiian-shirted and sandal-foot engineers know that sub stance is more important than style in dealing with technical ms, and so do those listening to them

If a company is to produce an innovative product, it must have some players who are allowed to express their creativity freely. Casting a pall of uniformity over an organization may make Barnett feel at home but does little to encourage creativity. Jon Gersh

Senior Software Engine Ennoy Corp.

Too arrogant

Regarding "Form nction" ICW, Sept. 5], the user often knows exactly what he wants. Assuming that he doesn't know what he wants or needs is a form of intellectual arrogan that has no place in the business world

nds to me like the chief It so architect should pick up the phone and ask some questions of those who do understand the business problem rather than spending his time trying to "re place the complex structure of interacting subsystems with linear arrays of standard types of components embedded in a foun-Forman and Hess claim that

ment of anything and everyth but the solution to a recognic es the task si molate software has its ce, but to attempt to general ly apply such a develop

Princeton, N. J.

Really needed? The focus on Naomi Karten's ar-

ticle [CW, Aug. 22] is unclear. She says the need of the function provided by information centers is rapidly diminishing, yet she exhorts them to communicate as a way of prolonging their exis-

When their need disappears so does their raison d'etre, no matter how successful they have en. Instead of com ir successes, they would be ter advised to assume resibility for more and m

Morquette Heights, III.

Face the music

A recent letter [CW, Aug. 22] asked IBM to halt their plans for object code-only in the best in-terest of the software and user es. I find the position taken to be quite naive.

IBM has been promising to withhold source code for severa years now. They have delayed their implementation of this practice under pressure from software vendors and users but have not rescinded their posi-

number of exits available, im-proved their documentation and ed improved tools for obing specific pieces of infor ion. They have now prom d that they will work sed that they will work with software vendors to provide the information which is required. All of this has clearly pointed to the fact that they are going ahead with their plans to secure

ir software via object code As a responsible software company, we have been enhanc-ing and improving our products, but always doing so with the rec-ognition that all dependence on

rce code was at best tenuous. We have therefore taken the position that these dep will have to disappear Ira W. Das Senior Vice-President. New Technology On-Line Software International, Inc.

Fort Les. N. I. Don't shy away

don't fault the basic message of rour editorial, "Playing with ire" [CW, Aug. 15]. However, I ties. In this way, they would do take exception to your rea soning regarding punishment o

> Ethics, values and a society that cares are needed. But realistically, we know that potential perpetrators of crimes are a part of the greater mix of society and rays will be. A large corpora-Continued on page 25

Computerworld welcomes or Computerword unicomes com-ments from its readers. Letters may be edited for bresity and clarity and should be addressed to Bill Laberis, Editor, Compu-terworld, P.O. Ban 9171, 375 Coter manager knowing when in-creased work load calls for a pro-

cessor upgrade or a DP director

recognizing a database integrity

There are seven basic determi-

out data, accuracy is primarily a

function of processing. At the in-

formation level, it is important to

computer programs, reflects the

real world properly.

2. Consistency. Two items

ay be accurate individually but

should not be used together be-

For example, dividing ann

sales by the size of the sales force

on Dec. 31 may oot yield mean

on if the sales force's size changed significantly during the

3. Conformity to user def

ce after the year ended?

initions and expectations. In figuring amount sales, how does

There are many possible ways

And the best choice for planni

next year's styles may not be th

right choice - or even a legal

formation systems leader who

does not know what the users expect is taking a shot in the

ice - for tax returns. The in-

one count returns that too

ingful sales productivity info

ause they are inconsistent.

sure that the conceptual mod

1. Accuracy. Given valid in-

nants of information quality:

el of the world, embod

all adds up

Climbing castles of data

On your way to the top, don't forget it is information that supports you



need for thos in charge of MIS to broaden their focus to include

sues, to consider business needs to become full-fledged members of the executive team But at the same time, there has been a less noticed revolution in what these managers

should focus on within their denartments. One way to understand this revolution is to see how manage-

rial titles have evolund In the prehistoric these managers were called tab hane supervisors. By the 60s, they had become computer managers, and in the 70s, they were directors of data

Now in the 1980s, we have vice-president of information systems or even, once in a while, the chief information officer.

Ungrading titles can increase one's salary and status. But the new subject matter with which the manager deals is the more reful change, whether it is the equipment used, the data itself or the information that the

Changing titles, and duties. imposes new requirements on the head of MIS. Technical skills were sufficient to manage tab equipment. If one knew h e a plugboard and clear a card

- skills non valued by museums - one was autified. Other ssues concerned er occi

The change to managing mouters meant develope new technical skills. Physic ills, such as mounting tapes or (still) clearing card jams, b the domain of machine operators. Computer managers d ith Cobol, product schedules and upgrade plans.

The next stage, re-onsibility for data processing, carried with it oversight of the sta being processed. to be input acefully and printed on time. The one who bore this responsibility

s a bona fide nior manager. Responsibility or information is

different from all that preceded needs replacing, a computer cenit. Information is the organization's lifeblood

The value of equipment can be measured by its depreciated price tag. The value of data can be measured by the cost of cap turing or creating it anew.

In both cases, the measured due may be high. But the value of information can be imm higher, Indeed, it cannot really be calculated, since it deends on how the information is

Responsibility for the care of ation is, therefore, far more significant than mere reality for the data that yields it or the machines that ess it. And this responsibility is totally separate from the much-ballyhooed topics of "busi-

ness issues" or becoming an executive "team player Responsibility for information means understanding what makes information "good" or

Making this distinction is as important as a tab machine supervisor knowing when a ribbon

Ignore what I said before

When you make a presentation, give them words

NAOMI KARTEN This article is a



about ignoring times - or at least being as aware of where it won work as where it will.

In a Computerworld column last year, I described problems with the computer-gen erated visuals that some people have used with presentations. Wordiness in text slides was one example I mentioned. Some crowd the slides with more words than the average person can read while listening to a speaker. "Ton y visuals look like a test for

Another problem I described was the poor design of pie charts, with too many parts and colors to the charts to the point

that they make no sense at all.

I suggested that speakers cut down on word and graphic slide and increase the use of pictorial or whimsical slides that make the point without needing to be read. rined that I was sold on this approach ever since I gave a presentation two years ago using slides prepared by a creative graphic designer. As quickly as I ined the points I wanted to make, be came up with cartoons drawings and clever ways to convey my message that were ex

4. Precision. Precision is not accuracy. The statement. "The current temperature is than tiny text, cryptic charts and multicolored glare 16.87344 degrees Fahrenheit Buoyed by my success with is quite precise, but — on a tropical July day — probably in-accurate. Too much precision this approach, I used it frequently — until it backfired.
On that day, which was about can be as bad as too little: Who six months ago, I gave a prese tation to a group of MIS direc

ds to read eight decimal tors using a set of specially pre-pared slides. Some were places on a speedometer at 65 h even if all are accurate Timeliness. All other things equal, earlier is usually better. But all other things are msical, cartoon-like slides Others were word slides but with the fewest possible number idom equal. How much earlier, we much better and with how of words on each I wanted the audience to lis-

ten. I wanted the stides to sup-port my talk — not dominate it. The speech went fine, I thought, but the written comments inmpact on other factors? 6. Cost. Many problems can be overcome by spending mon-ey, but check that what you are chided some negative reactions to my slides. The gist was that it aying is what your users and de-ertment really need.

7. Usability. Three-dimendid not appear that much time had been spent preparing them. This was not the case at all. I

onal graphs may clarify a rela-onship better than a book full of ables. The Official Airline Guide is an excellent example of the value of information usabilihers take in enorty. Its publi mous sums of money selling in-formation that every airline is ighted to give away free. w? By making it more usabl ome of the seven factors are le: precision, timeliness, us-

ew words where they're used to seeing an overdose of words dolah Mass

had carefully planned the mes sage that each side was to con

vey and had put quite a bit of el fort into the design. But at leas

some people saw slides with pic-

tures in areas they're used to

ing words; some saw very

They concluded I must be lazy Clearly, laziness is in the mind of the beholder. Words come easily to me, and if I had prepared 20-word-per-line or 40line-per-page text slides, then a charge of laziness might have been valid. But for me, conveying a message with pictures is

stides were really good. The graphics specialist I worked with eserves the credit. He could see possibilities in areas that I couldn't, and he devised cleves ways of getting the pount across without resorting to words. He told me that most of his clients want their slides to contain the greatest possible word density at the technology will allow, even though the result is impossible to read

At one time. I would have insisted that these people were wrong to want to pack their slides with words, but now I have to accept that maybe they're right at least some of the time.
This audience of MIS direct ors equated words with effort. legardless of the words coming

out of the speaker's mouth, if the slide did not contain words, it ant the speaker was lary. But there is another point. I think that these executives felt

that at their level, pictures were beneath them. They were seri ous business pro

Swamped with info I also suspect that given the cost and duration of this forum, they wanted to feel they were being dated with information even if they couldn't absorb it. I found evidence to support these views in some of the o ms at this forum. The speakers in these sessions did,

leed, use complex, multima trixed, word-intensive, informa tion-packed slides. I knew these spe had seen many of their slides. Even so, while listening to their words, I found it difficult to si-

multaneously absorb all the in formation in their slides. But the audience didn't criti-cize the presentation. The slides looked informative and, apparently, that was value enoug

Courses in presentation skills frequently address the how-too of computer-generated presentation visuals. These courses urge students to avoid wordx to look at or difficult to emprehend. It's good, common nee. Unfortunately, simplicity of clarity can backfire.

nes you have to connd recole in order to impress

How KBMS solves a new class of applications.



Until now, mainframe computers have been primarily used for solving the clearly defined, highly procedural tasks in your

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in your company that arm't rigidly structured Your as credit authorization, order configuration, risks analysis, forecasting. These are the high-level tasks that involve judgement and complex rules. In many ways, they the most important of all, because they involve strategic decision-making and corporate policy. Now KBMS, the Knowledge Base Management

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Mallach FROM PAGE 23

stency, conformity to definias and other cost eleme Users tend to be realist about visible information quality

actors but wildly opti about invisible ones. An information systems chief,

wever, cannot afford this There are trade-offs an the seven factors. For example,

a 3-D graph will cost more than a report in terms of equipment ded to create it, software kages to be bought, progr

Letters FROM PAGE 22

tion may have numerous securi-ty guards and elaborate controls on physical access. If an illegal entry occurs in spite of these precautions, they aggressively and publicly strive to enforce

lut does this same corporation place equal security mea-sures on the extremely valuable sensitive data residing in its ermation systems? Often, it s not. So when illegal entry is ned, rather than risk the at-dant publicity regarding their bility, the corporation the matter, quietly s internal systems-entry will not reoccur.

s. When that is done, the rporation must vigorously and apologetically pursue punish-ent for those evade the securi-Marshall H. Austin

Slant rant

The story "Bells ring hollow in information business" [CW, Aug. 1] gave a biased view of my com-pany, Pactel Infosystems.

who feels that Pactel botched up" retail sales? Your eporter was editorializing, not ar decision to rechannel our

m retail outlets to direct was based directly on an asof our customers Our surveys showed that gly prefer to be ser rect corporate sales force. Michael M. Ma Kieve

nt, Computer Division Pactel Infosystem Walnut Creek, Calif

mer time and resource usage. It will also take more time to pro-

The correct choice in making trade-offs depends on the value of the information at different

points in the quality spectrum which in turn depends on hos the information is to be used. tems manager must und

HE EXECUTIVE WHO spends time thinking great thoughts without first getting his or her own house in order is building castles in the air.

the nature of information, tree factors that determine its quality

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SYSTEMS & SOFTWARE

SOFT TALK

William H. Inmon

What price normalization?



cted on a basis of intellectual al and intuition. Normaltion advocates point out the rity of data structure when data is decomposed into simple more stable structures. Nor-

ation has the effect of scatoss a given unit of physical

Denormalization propo-nents point out the inefficiencies of processing that result from creating many small, physically senarate pools of data. They advocate concentrating data in a common area of storage for op-

um access. In an attempt to resolve the dispute, George Coleman at Am-dahl Corp. in Chicago conducted a large study that took a quantified look at normalization vs.

The study was run on an Amdahl 5890-300E mainframe ng three groups of transacns, each accomplishing the Continued on page 31

Accounting lives! Spate of rollouts invigorates market

BY AMY CORTESE

The accounting software market isn't dead yet. A wave of product ntroductions in recent weeks the aging market.

has infused new technology into Financial accounting and oth-er traditional back-office applica-tions are increasingly viewed by executives as one more way to

use information for strategic advantage, despite their image as tired workhorses. The market has not been the

most dynamic in the computer industry in recent years. But David Brownlee, president of Walk-er Interactive Systems in San Francisco, noted, "A market is only saturated until there is bet

ter technology available. Compa-nies are always looking for a

vendors are responding to this shift and positioning their products as mission-critical ap-plications. New capabilities now allow financial management soft-ware to be an integral part of a acts introduced recently il-

strate this trend. Ross Systems, Inc. intro-Ross Systems, Inc. intro-duced last week its next genera-tion of accounting software for the Digital Equipment Corp. VAX. Three weeks before, Ora-cle Corp. had Isunched a financial product line for the VAX, Se-quent Computer Systems, Continued on base 34

DB2 2.2 shows IBM is serious on distribution

BY STANLEY GIBSON

IBM is serious about making real what some view as a compu-nirvana — a distributed relat-al database within the guide of Sustems Application Arch al database within the guidelines of Systems Application Architecture (SAA). Although the company has previously talked of plans to offer such a system, the recent announcement of DB2 Version 2 Release 2 puts the firm's official seal on that intent. The distributed capabilities that will be available with Resea 2 will out be shiround until

lease 2 will not be shipped until the third quarter of 1989, but that is additional indication that a long-range blueprint is being im-plemented, according to observ-

ers familiar with IBM's Santa Teresa, Calif., development ef-

The announcement was made a year ahead of time because IBM is serious about distributed relational, and the company wants to give its customers time to plan, said a source with ties to the DB2 development group. The source said users inter-ested in distributing data will

have to begin now — if the have not already — to import the hardware and netwo multiple computers in different locations and an extremely pow-erful and reliable network. Continued on page 32

Data View Wang courts lawyers A survey of 100 MIS directors found Wang to be the predomi supplier of word processing software to the least market



Anticipating IBM's next five years

BY CHARLES BABCOCK

IBM is going to move much of its software and, it hopes, its cus-tomer base under the Systems Application Architecture (SAA) rella in anticipation of freeing its clients from dependence on 370 family hardware and operating systems. By doing so, it will allow its

customers to take advantage of

parallel processing and other new hardware technologies that are likely to dominate the mid-1990s, according to Michael Braude, vice-president of the Gartner Group, Inc. in Stamford, These and other predictions

were part of a recent airing of Continued on page 33

 CASE researcher forms users group. Page 29.

• Star Technologies claim its CMOS processors no 100 MFLOPS. Page 29 More database vendors enroll in Unix show's per mance review. Page 29.

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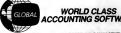
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HARD TALK

Rosemary Hamilton

DG's image problem



still knows how to come out with

From analysts and users like came loud applause for the

me supporters came words of neern about DG's ability to turn this into a winner. Often, product alone doesn't carry a company to new heights of success. A firm also needs a good image to carry it. An image

good image to carry it. An image that says this company will be around for some time to come. An image that assures customers it is worth making a big investment in it. But these days, DG is perceived as a troubled

DG is perceived as a troubled minicomputer maker. Its troubles are real. The fi-nancial problems DG has had are fact. But it keeps shooting itself in the foot trying to fix those problems. If the company could with these problems, uners and analysts who help shape indus-try opinion might give the com-pany the chance it needs to turn things around.

Low-key rollout At the MV/40000 press conferce in New York earlier this onth, one could almost feel monn, one coun amost feel the negative perception in the air. Here we had a company rolling out the highest perform ing system in its history, the new generation of its flagship product line. Traditionally, cial effects and long speeches

special emecus and long speciales by guag-ho executives.

But this event was a quiet one. Three speakers, including Edson de Castro, took about an hour to present the product. De Castro then offered a question-and-answer period, but fewer and-answer period, but fewer than 10 questions came from the audience. He then thanked the attendees for coming, and the event closed. There was none of the applicate typical of a big product rollout. Certainly a contributing fac-

tor to the solemn atmosphere was the news of more layoffs,

CASE users group aims to rein in hype

BY NELL MARGOLIS

When Case Research's first an-mal survey of the computer-aid-ed software engineering (CASE) market turned up a surprisingle low level of actual CASE imple mentation at large commercial and industrial sites, the Belle-vue, Wash-based consultancy and market research firm decided to not just report on the situa-tion but alter it.

national association called CASE
Users Group — the first organized forum for education and
exchange among CASE users
that is neither directly nor indirectly sponsored by a specific
tool vendor, according to Case
Research President Greg

"The gap between the real-ties of implementation and the hype about the technology is bigger than it's ever been, and more input from vendors is a far cry from what's needed to change that," Boone said. Case Research — which,

Boone said, is serving only as a necessary catalyst and plans to have no controlling role in the have no controlling rose in the group once it is up and running — is starting small, with a Wash-ington-based group that its orga-nizers hope will become the Se-attle-area chapter of a national organization. Such matters as dues, organizational structure and publications have yet to be

however, the idea is attracting users, many of whom see in CASE the same need for peer-to-peer communication — in the true sense of the phrase — that galvanised Case Research.

Users — current and prospective — who are helping to form the Seattle area chapter of the association new the effort as a potentially while way of administration of the seattle control of the seattle contro

Mark Smith, an eng

toos. Case research is at seast nominally independent."

The kind of user exchange that the new group hopes to fo-ment, Smith said, could aid in abating another problem now rampant in the CASE area.

Star says **CPUs** notch 100 MFLOPS

STERLING, Va. - Star Tecl nologies, Inc. recently rolled out its VP Series of 32-bit CMOS claimed can operate at speeds of up to 100 million floating-point

The VP-2's dual compute-head design provides up to 100 MFLOPS, while the VP-1's single head delivers 50 MFLOPS. The VP-1 is upgradable to the VP-2 with the addition of a sec-

ond compute head. The VP series also sup 100M byte/sec. aggregate main memory bandwidth and three I/O channels operating at a maximum of 50M byte/sec, on the di rect-memory access channel These features allow the series move and process data sin neously, the firm east. The VP-2 and VP-1 ve

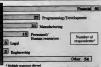
rocessor series are targeted to-ard real-time compute-inten-we applications, including de-mar processing, satellite imag-g and seismic data processing. Star also claimed that the VP

computing resources.

The VP series is available within 90 days of receipt of order. The VP-2 sells for \$95,000, while the VP-1 will go for \$85,000.

Data View

AS/400 applications ns will be the most popular on IBM's Applicati rding to 95 companies surveyed that intend to purchase the machine



Three more database vendors

— The Santa Cruz Operation
in Santa Cruz, Calf., XDB Systems, Inc. in College Park,
Md., and Intersystems in Cambridge, Mass. — have signed up
to participate in the 1988 Unix
Expo Database Performance Review, to be held from Oct. 31 to Nov 2.

from Oct. 31 to Nov 2.

Other participants include
Unity Corp., Concept Omega,
Micro Database Systems, The
Small Computer Co. and Worldwide Data. In addition, Neal Neison & Associates, which is chairing the performance review, has
invited customers, developers
and consultants to participate,
since many most vendors have since many major vendors have responded that they are unable to find the time and resources.

More hats tossed in database review ring

test of Oracle Corp.'s Oracle da

Verdix Corp. in Chantilly, Va., announced that its Verdix Ada Development System, or VADS, has been chosen by Gen-eral Electric Co. for a U.S. Navy

applications.

Each development system was designed for use with a specific computer and must be validated annually. Nearly 40 VADS have been validated to date. The current VADS comeists of an Astronomier and more than 20 onlyware tools. The GE contract is expected to bring Verdix approximately \$1 million in revenue for the year. e for the year

The Small Computer Co. in COMPUTERWORLD

lected as one of Unisys Corp.'s 11 master value-added resellers (VAR) in the U.S. The master VAR agreement allows Sc Computer to market Uni complete line of PCs and in computers with its File Pro d base management product line for Microsoft Corp.'s MS-DOS and Xenix systems.

ems, has acquired from Systec Corp. its In Box elecmanuse Corp. its in Box elec-tronic mail package for Apple Computer, Inc. Macintosh and personal computer local-area networks. Under the agree-ment, Tops has gained all mar-keting and product development rights to In Box, and the prod-uct's development and aumount uct's developers and supp staff will join the Tops divis

cluding Sun workstations According to a Tops official, the company intends to create an E-mail standard for the entry-level LAN market.

Dynamics Research Corp. in Andover, Mass., announced the availability of the Adsmet soft-ware quality analysis tool on Sur-workstations and the Rational R1000 Development System. Adamst is also available on the Digital Equipment Corp. VAX series under VMS.

Radley Business Comput-ers, a West Bloomfield, Mich-based authorized MCBA install-er, amounced that its Carae (EDI) package is now integra with MCBA's accounting, dis bution and manufacturing applications for the DEC VAX. The EDI package enables electrons transmission of butiness docu ments, such as purchase order

Now, you can speed the emergence of new systems while you extend the useful life of existing ones.



grammer productivity and enhancing the que of existing systems at Boeing, Shell Oil, The Hartford Group, Ford and many more Fortune

The CASE for re-engineering



Inmon

FROM PAGE 27 same business purpose. The only difference was the norm ization or denormalization of

The first set of transactions was normalized. Eight tables were accessed by the transactions with 30 to 90 rows acssed per transaction, 50,000

rows per table, with a row length The second group consisted of four tables with 20 to 60 rows ccessed per tran

There were 25,000 rows per table with a row length of 115

The third group had two ta-bles and 15 to 30 rows accessed per transaction with a row igth of 215 bytes.
The progression is toward

an increased degree of normal-ization. As data is normalized, there are fewer tables with less dynamic interrelationship be tween tables and larger row

The job stream uniformly id 10% update and 5% insert/ lelete activity. The rest of the activity was simple access or re-trieval of data. Each update aged the length of the row.

on DB2 under TMS/DC. Transaction Processing Network Simulator (TPNS), an IBM soft-

ware product that generates transactions, was used for the network driver, running on an IBM 3090 Model 200. Both sim ulated the same level of user ac-tivity - 100 terminals, each serving up a transaction every

10 seconds.

The first benchmark used only transactions from Group 1, the normalized lot of transactions. The second used only transactions from Group 2 and 3, the denormalized lot.

The results
The normalized run had an av-

erage response time of 1.48 sec. queue to queue. The second run, the denormalized one, had an average response time of The average CPU utilizar

for the first run was 16%, with a maximum usage of 21.4%. The average CPU utilization for the second run was 11.1%, with a maximum of 12.5%.

num of 12.5%. ese numbers indicate that alization of data, if you care about performance or hard-ware utilization, is one of the numbers you look at, normaltion costs from 100% to

tion in terms of performance and

tion is terms of performance and hardware usage. Put another way, if it kkes I million instructions per sec-cond (MIPS) to run a normalized application, it states is MIPS or less to get the same throughput the performance of the same throughput Described in the same throughput the same throughput is the same less to get the same throughput is Described in the same throughput is been and cry that aryone who denormalizes data is secting back the progression of the industry. But there is no reason denorma-them to the same throughput is the benefit is much higher levels of performance.

man says normalization Coleman says normanasans, is fine for some applications:

• Very small data bases in which most data can be put in main memory or a few physical blocks of data on disk.

• Databases that do not require

 Databases that do not require performance or in which there is ncern as to the amount of ware needed to support the

As a basis for the first cut at database design, before data must be physically defined to the DBMS.

Buckeyes choose Honeywell

The Ohio State Teachers Retire-ment System recently bought a Honeywell Bull, Inc. system worth \$2.7 million that will

worth \$2.7 million that will serve as a disaster recovery unit. The system includes a DPS/ 8000/82 minframe. a 3380 storage subsystem, two frost-end processors, a DPS 6 Pass minicomputer and a local-area network. The system will association in prinary computer facility, which is also made up of Honeywell

Systems Industries, Inc. said it is shipping its disk subsystems for the Digital Equipment Corp. platform. The SI93 will be offor the Jugitus companies.

Justiform. The SISB will be offered with a 10% price cut as
well. A typical suboyatem with
eight SISB disk drives now sells
for \$134,700, down from
\$152,200. The company said
maintenance fees have also been
cut by as much as 50%. A fivematerial control of the company said
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maintenance fees have also been cut by as much as 50%. A five
maintenance control of the company said

year maintenance contract for the eight-disk-drive subsystem now priced at \$21,034

The North American Aircraft di-vision of Rockwell International has installed a superminicomputer from Convex Con

Corp. The C210 single-processor system will be used for com-

Atlantic Computer Systems, Inc., a subsidiary of Atlantic Computers PLC, recently acquired another leasing firm, Datalease Corp. in Westport, Com. Atlantic leases IBM and DEC systems. Datalease has operated in those markets as well but also leases Wang Laboratories, Inc. consistence.

DaiNippon Screen Manufactur-ing Co. Ltd in Kyoto, Japan, has agreed to resell ink-jet printers made by Iris Graphines, Inc. The printers will be rolled into a system DaiNippon will market that includes an Intel Corp. 80286-based processor.

Apollo Computer, Inc. anounced it has begun shoping its Series 1000 Personal Super-computer, which is based on a new Apolo architecture. The ar-chitecture, called Parallel Re-duced instruction Set Multipro-cessing, is said to provide supercomputer-like functional-ity in an office system. The sys-tems start at \$70,000.

Inet

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DB2 2.2

CONTINUED FROM PAGE 27

Glover Ferguson, director of development for the Foundation DB2-based comter-aided software engineering tool at thur Andersen & Co. in Chicago, sug-sted that IBM's early announcement d have been because of a different

"They may want to freeze the mar-ket," Ferguson said, pointing to competi-tion IBM faces from software vendors ofshifties on both IBM and non-IBM iware. He noted that Oracle Corp. and ational Technology, Inc. both offer

two features announced in Release 2 Ver-sion 2 — for users of Digital Equipment

Corp. systems.

Ferguson said that if distributed relational features are available now under DB2, it would be in IBM's interest to make them available as soon as possible in order to encourage IMS users who have implemented distributed functions under

at system to convert to DB2. Dale Kutnick, an independent consul-tant in Redding, Conn., said the company has actually solved most of the key technical requirements of a distributed relation-al database and, in fact, implemented them in R-Star, an in-house IBM distrib-

uted relational prototype. R-Star is an MVS-to-MVS database, many features of which are likely being in

cluded in the new release of DB2. However, it is IBM's goal to create a distributed relational system that includes O5-based Personal System/2s and Application System/400s and its own unique relational database. A commitment to include these systems makes implementation more dif-

lysts said.

Kutnick said R-Star includes a two

phase commit, necessary for updating multiple sites. However, implementing a two-phase commit in a commercially available product across a large corporaavanance product across a large corporation's network using disparate system difficult, Ferguson pointed out. And the arc other potential stumbling blocks.

"They have not even tackled the th

two different tables on two different nodes," Ferguson said. Nonetheless, IBM's customer letters. sent with the assouncement, mentioned both OS/2 Extended and OS/400 as equal players in the distributed relational data-base of the future. "IBM intends to imple-ment distributed unit-of-work access from any SAA relational environment to any SAA relational environment," the customer letter said.

A source familiar with DB2 develop-ent said the new version of QMF, an-ounced with the new DB2 2.2, also indinounced with the new bolz 2., also uts-cates seriousness about implementing SAA. The QMF version, which is mens-driven and usable by non-data processing professionals, parallels the query product on IBM's OS/2 Extended Edition.

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Hamilton CONTINUED FROM PAGE 29

these two announcements is a typical ex-ample of DG's problem. The company ample of DG's problem. The company-consistently fails to manage its au-pouncements — good or had — in a way that help its insunge, And the more it harts its own image, the harder it is for DG get the instantly took on its side. The product amouncement had been in the works for week; invisitions went out in early September. Yet the compa-ny syrung the bad news on the industry and days beforehand, managing to rain

Work on that delivery
Bad news is bid news, and I wouldn't
suggest that DG try to fail off signoffs as
strictly a positive thing. But the way the
company delivered the news could have
been improved upon. DG could have
worked more closely with customers and
industry analysts who help shape opinion
to help them understand why the consolidations were taking place. Instead, the
firm just dropped the terrories. What try, catching people by surprise. What this got DG was more skepticism and co cern that the company can't resolve its

According to one industry analyst, DG executives provided an advance an-nouncement of the big product introduc tion during the week b tion announcement. The presentatio was upbeat, and no mention was made of future outbacks. The analysts, as one told me, came away feeling pretty good out DG.

Then they got the surprise news the DG was axing 800 jobs and closing two plants. Thin, to say the least, didn't go ower well So the product rollout had a dark

cloud hanging over it, which took away from the what was actually being an-nounced. Afterwards, observers wrapp their praise of the product in heavy size "Buying decisions are no longer just price/performance decisions," said Ste-ven Widen, an analyst at TFS, Inc. in Westford, Mass. "Long-term viability of

Westford, Mass. "Long-term visibility of the company is very important. "Image is a very difficult thing," he added. "Once a bad one is attached to a company, it's very difficult to get rid it. DG will continue to struggle with

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IBM The Bigger Picture

0 IEW 70

IBM FROM PAGE

"IBM - The Next Five Years,"
a pay-per-view satellite broad-

a pay-per-view satellite broadcast by the Computer Channel, Inc. The Floral Park. N.Y., startup firm is taping a series of programs on compangement and other database management and other issues to sell to corporations as a substitute for sending MIS startl members to technical confer-

ences.
Brassde said SAA, while not yet a full-fledged software architecture, is more than a "marketing" architecture. It is a bloopint for IBAK, it is what it would do if it only could, "Brassde noted, While IBM customers would he naive to believe IBM can accomplish all the goals of SAA quickly, he said, it is likely to push to completion the parts of SAA that rest on a firm business.

Those include implementing SQL and relational databases across its range of hardware platforms and providing common communication protocols and end-user interfaces for users at each level of corporate comput-

ing, he said.

IBM has couched its description of SAA as a pursuit of software portability across its varied operating system environments. But what it is likely to deliver, Braude said, is a "sangle-system image" to end users working on intelligent workstations.

intelligent workstations.

White collars and SAA
Most white-collar workers will
be workstation users within six
years, and under SAA, they will
not need to know where data is
located or how to access it. They
will not need to be trained in the

not need to know where data is located or how to access it. They will not need to be trained in the individual sideopyracies and commands of the application they are using because notivered as a common user interface and background commentications.

IBM prefers to talk about software portability rather than aningle-image systems because "the muriteding folls: chose a simpler message rather than a more complex message," Brusde said. But the Gartner Group believes IBM will success

"The marketing tous choose a simpler message rather than a more complex message," Braude said. But the Gartner Group believes IBM will succeed in migrating its customer base to SAA. By the late '90s, IBM will be free to add parallel processors or neural networks to a corporate computer environment, and end users will not he aware of any change in the underlying processors, he said.

Such a move would also free

BM to move to an operating system that could not be duplicated by competitors, according

to Braude.

Other predictions included in the broadcast concerned IBM'a mainframe relational database management system, DB2, and its still unannounced repository,

The Gartner Group believes IBM will have succeeded in placing IBRs in all its major accounts by the year 2000 and is likely to have it in nearly every customer site by 2005. It estimates the number of licenses sold to date at 3,100, compared with 4,800 licenses sold for IMS, IBM's odeer, hierarchical database system.

er, hierarchical database system. By 1990, the Gartner Group expects that ratio to he reversed, with DB2 empying a larger installed base than IMS by a margin of 5,400 to 4,960. The gap will continue to grow after that as DB2 takes over more almore of IMS' work, Braude said.

IBM views longing a leading edge on BRS as ensential to neque on BRS as ensential to neceas against other software vendors, including Computer Associates International, Inc. and
Oracle Corp. IBM rapid moves with DRS are making it more and
more difficult for independent software vendors to justify the
research and development expense to compete in the DBMS
areas. he said.

While IBM's often referred to but unannounced repository may set a world record for conjecture, it is expected to materialize next year as a single point of system information. It will make available key information in a mixed operating system environment and serve as a founda-

tion for software develop Braude predicted. With a repository and based DBMS systems doning the scene, IBM will fur

based DBMS systems dominating the scene, IBM will furnish a playing field on which customers and third-party vendors will find it easier to write applications. The level playing field will spur demand for computing re-

spur demand for computing resources, generating IBM revenue, and megaphyers will emerge as software suppliers. CA, which recently became a \$1. billion company with the acquistion of Applied Data Research, Inc., is the prototype for what is ilicely to be about 11 companies supplying 80% of the software by the mail-1990s, Braude said. Oracle, Microsoft Corp. Die; ital Equipment Corp, and IBM itself are likely to be among the

group, he noted.

With the price of admission to this select group rapidly going higher and higher, the Europeans and Japanese are likely to try to form business combinations that allow them to stay in the

Hitachi adds optical unit

SAN BRUNO, Calif. — Hitachi America Ltd. has introduced a high-performance 54-in. writeonce optical-disk library unit fenturing high-speed access and a small computer systems inter-

face (SCSI).

The OL101 has a maximum storage capacity of 28.8G bytes configured with 48 optical disk cartridges and was designed for connection to a host via an SCSI

bus, the firm said.

The unit also features a front loading cartridge mechanism equipment and error status reporting on a 2-char. LED pane and an internal maintenance pan

el for off-line diagnostics.

The OL101 incorporates as many as four optical disk drives, an optical formatter/controller and an automatic cartridge-loading mechanism. It also features a 690K bit/sec. data transfer rate, an automatic detection/correc-

an automatic detection/correction function and a batterypowered memory backup.

The OL101 is expected to be available in the second quarter with pricing of a 48-cartridge

with pricing of a 48-cartri configuration set at \$26,0 the firm said.

Accounting CONTINUED FROM PAGE 27

Inc. and Hewlett-Packard Co. environ-ments, building on its success in the data-base market.

On the mainframe side, Walter Interactive in July announced IBM DB2 apport for its financial applications. And port for its financial applications. And port for its financial applications. And the maintains of the IBM world McCormack. Ibc., to an Management Science America. Ibc., to an America Ibc., to the maintain and the moves into the mail-range market.

Financial applications are being interpreted with word processing, electronic mail, spreadsheets, decision support and applica to improve presentation and

INANCIAL SYSTEMS need to be more flexible than ever in order to adapt to changes in today's business environment, in which change is the only constant.

communication of financial information. Features becoming standard with finan-cial applications include the ability to cusse screens and tailor menus, integran with productivity tools and usered keystrokes

The net result of these improvements is to give users more control over their operations. Financial systems need to be ore flexible than ever in order to adapt to changes in today's business environ-ment, in which change is the only con-

stant, several users said.

Ross is the latest vendor to insugurate new functionality with its Renaissance series. The product line success the firm? ries. The product into succeeds the irre in MAP line and was designed to allow inte-gration of applications in a single operat-ing environment. The software features the ability to integrate the Ross financials with other VAX applications, such as spreadtheets, word processing, decision support and Vazmail, Ross said.

ries con

general ledger, accounts payable and pur-chase order — all available now — and accounts receivable and fixed assets — set for availability in first-quarter 1989. Upgrades are free under the mai ract; otherwise, prices start 000, depending on CPU.

\$23,000, depending on CPU.

"The financial accounting software market is a market waiting for something

market is a market waiting for something new to break it loose, and that is a characteristic of a mature market, "said Robert, and the chargest, What is needed to break it loose" Ago off distributed application."

Oracle Planacials may be just what the doctor ordered to lives up the silling market, according to Oracle, Ballie on the Charletton, the financial applications were designed to run transparently across many computer systems and will soon be igned to run transparently across my computer systems and will soon be egrated with E-mail, the vendor said.

Banding with rise wind
Flexibility is certainly one of the most important qualities of financial systems today, and the state of the state of the state
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most important consideration in choosing accounting software, Myrick said. The to-bacco division decided on M&D's General Ledger: Millenium Release 3.0 because of

Walker Interactive's Brownlee said IBM's Systems Application Architecture is the way to go for large shops. The comunit's Systems Againstine Architecture programme and the control of the control

complement its mainframe line; last year the firm introduced the Satellite versions of General Ledger and Accounts Rece

of Gaman Ledges our decounts Warneld-out of the Common Common Warneld-ble a cooperative processing of structs. New is not accessarily better, lower-er. To soon contactors, the Mich Wolf-in, and the Common Lower Common Common Common Common Common Lower Common Commo many options, the tirm choice which oc-cute it was proven and easy to install, Wolfe said. In Wolfe's opinion, the func-tionality of most packages on the market is comparable; what is important is that updates and enhancements are timely and keep up with changes in tax rules.



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IBM. The Bigger Picture

Disaster recovery arena catches fire

BY JAMES DALY

There's an old saving that there are two times when you prep for a disaster: the first time you're taught how and the first ne you lose something important. Apparently, many data centers are not about to make the

CASE

A recent study by Focus Re-search Systems, Inc. found that the use of disaster recovery and ackup systems has grown dra-

There's a lot of confusion between CASE tools and CASE methods," he said, "All too of-

ten, people want — and in many cases expect — to buy a tool,

turn it on, and have it magically produce dramatic results. When

matically during the past two years and that the average data

More than 91% of the IBM and plug-compatible mainframe sites surveyed have prepared for the worst and made contingency plans for calamity with some sort of disaster backup and recovery m. Only two years ago,

nearly 40% had no disaster back and recovery plan at all.
"Many industries have sud-

their data is very valuable," said Soott Brown, a researcher at Forocessing manager's preoccu-ation with protection is not liscus. "We've seen a lot of interest

from companies in very informa-tion-oriented industries, like in-surance, finance, banking and täities." Well-publicized upheavals like 1986 Boston fire that damaged the Putnam mutual fund compa-nies, electrical mishaps in Manhattan last year that sidelined the computers of Chase Manhattan Corp. and Manufacturers

will not do — cannot do — is tell the user which of the three to produce first. For this, Smith

said, you need a methodology — a fact many users do not grasp til inconveniently late. What is more, Smith said, in

some cases, potential users are being inadvertently misled about the complementary roles of tools and methods. "I'm not sure," he said, "that all the vendors appre-Users are also facing ques-

produce dramatic results. When it doesn't, they feel betrayed and say that CASE doesn't work."

For example, Smith said, a frost-end CASE design tool might present the user with three alternate ways to repretions about who the customer is and who the software is really nt a step in the software design process. However, what it

based Northwest Division of Wil-bur-Ellis Co. As a sales distribution business serving the agricultural industry from 55 separate locations, Wilbur-Ellis' ustomers range from one-man rms to large conglomerate or-nizations, Bergen said. The information systems department is currently trying to design an

er-entry system to be used in the company's sales depart-ment. "Who do we aim it at?"

Bergen asked.
Wrestling with this question, he said, leads to another issue.
Both, Bergen hopes, will he beneficially addressed by the CASE

Hanover Corp. and a fire in May at a telephone switching station in suburban Chicago that knocked out more than 150,000 nouter connec

tions ICW, May 161 have tended to serve notice of the importance of disaster recovery. But the report did not name specific causes for the turnabout.

Buy safety Under a commercially available disaster recovery plan, companies essentially buy an insurance policy in the event that a fire, flood or other disaster cripples an essential system. The cus-

To create software that actu-

ally serves a company's nee

"software designers have to know and understand what those

needs are, how the business

works, what kinds of goals it's trying to meet," Bergen said.

More than just code Software, he said, "isn't just pro-

software, he said, isn't just pro-gram code — it's the implemen-tation of the way the business people are thinking." Converse-ly, a software system should be a

ly, a software system should be a tool for the way people do busi-ness. CASE ideally should serve both of these ends, he said. To reach that ideal, however, there has to be a level of communica-

tomers buy a guaranteed space on a backup computer on which they can run their programs until the original machines are fixed or replaced. Disaster recovery firms have,

in turn, greatly benefited from the new interest in contingency the new interest in contangency planning. Sungard Data Sys-tems, Inc. nearly doubled its rev-enue during the past five years to \$91.1 million in 1987, while Comdisco, Inc., which special-izes in computer leasing, said its disaster recovery revenue was about \$60 million in the fiscal year ending Sept. 30 — a 50% increase from a year earlier.

tion and interaction between the business people and the systems people that is all too often lack-

Therefore, Bergen said, when it comes to CASE education and interchange of ideas, "I need a forum where I could very freely invite business people, without putting them to a great deal of expense and inconve-nience, and have them consis-

tently return."

Vendor-specific groups that meet once or twice a year on a national level, he said, whatever their benefits, do not provide such a forum; the Case Re

down their database uarantee.

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IBM The Bigger Picture

rocessors

According to the vendor, the 100 Plus system offers im-overments for windowing and

Pricing for the 3000 Plus be-ns at \$16,995, and current tra 3000 users can purchase a

ira, 59 Technology Drive, il, Mass. 01851. 617-937-

), the machine is available in or-mount and desktop models

PRODUCTS SYSTEMS

unit supports from eight to 120 ports and up to 24M bytes of

main inemory.

A fully configured 120-port version, including The Santa Crus: Operation, Inc.'s SCA. Kenix 386 operating system, is pricod at about \$85,000.

IBC, 21621 Northoff St., Clasticorth, Calif. 91311. 818-

Data storage

system is reported to be fully nat- and media-compatible the ANSI-standard IBN

Fast A480 is available in three configurations priced i \$54,870 to \$136,610.

Pizza, 11770 Bernardo Pizza. Court, San Diego, Calif. 92128. 619-487-8030.

ompany said. se standard ASCII printer is said to incorporate both Cen-tronics Data Computer Corp. parallel and RS-232 serial ports

purame and RS-Z32 serial ports as well as a proprietary software tool for document design. Laser Check Printer Model 636 costs \$7,388. Digital Design, Suite 101, 2955 Hartley Road, Jackson-ville, Fla. 32217. 904-268-



COMPUTERWORLD

products.

The Vari-Scan EVM 900
9-in. model and EVM 1200 12-in. model are targeted at the medical and financial market-places, the company said. The units feature ultrasound capabilities and can reportedly display 16 discernable levels of black,

synchronous output.

The EVM 900 costs \$715, and the EVM 1200 is available

Electrohome, 809 Wellington St. N., Kitchener, Ont., Canada N2G 4J6.519-744-7111.

flow-meters for the process instrumentation and control
markets, has announced an accessory product — the Model
PX-90 Ticket Printer.
The product — the Model

The product is a stand-alone rinkout device said to print ain-

via the Exac RS422 con comport for data transfer and is especially suited to custody transfer, point-of-sale and re-cordable botch control applica-tions. Engineering units can be configured for pounds and gal-loos or kilograms and liters, the vendor said.

ventor said.

The Model PX-90 Ticket
Printer costs \$1,400.

Exac, 6410 Via Del Oro, San
Jose, Calif. 95119. 408-3653500.

Mitek Systems, Inc. has a sounced its Tempest Postscrip user printer, the Model 130T The product was reported signed to provide full Ado

d odd paper sizes. Total memory is 2M byt

Dataproducts Corp. has introduced en-hanced versions of its LM 300/315 and LM 600/615 line matrix printers. The unit one feature Printronix, Inc. P-Se-ries emulation, improved print bar design and extended verifiability of ribbons, ac-

and extended verifiability of ribbons, ac-cording to the vendor.

The printers also support Hewlett-Packard Co.'s Printer Control Language.
The LM series prints text and fine charac-ters as well as graphics and bur code and has a reported mean-time-between-fail-ures rate of up to 8,600 hours. The tabletop LM 300 model prints up to 420 line/ min; the LM 600 prints up to 840 line/min and is configured in a full cabinet. Both the LM 315 and the LM 615 include quiet full ets with a reported rating of 55 dba. e vendo, said.

The LM series is priced starting at Dataproducts, P.O. Box 746, Wooland Hills, Calif. 91365, 818-887-8000. roducts, P.O. Box 746, Wood-

Hewlett-Packard Co. has added two atures to the Ruggedwriter 480

The 24-wire, 480 char./sec. dot matrix er can now handle six-part forms and a recommended maximum use of 5,000 pages per month, the vendor sa vriter was introduced in Sep-

Ruggedwriter was introduced in Sep-tember 1987 and formerly produced four-part forms and had a recommended use of 3,000 pages per month. The printer in-corporates RS-232C serial, Centronics Data Computer Corp. parallel and HP-IB

Ruggedwriter 480 costs \$1,695. HP, Customer Information Center, In quiry Fulfillment Department, 19310 Pruneridge Ave., Cupertino, Calif. 415-857-1501.

high-volume page printer has been in-reduced by General Business Tech-

A high-votative page parties troduced by General Business Technology, Inc.
The CBT 6615XP reportedly attaches to all models of the IBM Application System/400 as well as IBM System/36 and 38 machines. The 15 page/min printer has 300 by 300 dot/in. resolution, according to the

The GBT 6615 costs \$7,995. GBT, 1891 McGaw Ave., Irvine, Calif. 92714. 714-261-1891.

T & B Computing, Inc. has revised Gi-gasav, its videocassette recorder-based

subsystem. The product can now be used with Prime Computer, inc. machines. The subsystem can back up 1.6G to 2.4G byten on a single standard VHS vi-deocassette in six hours or less, the ven-dor said. Gigsaw consists of a VCR unit, cabling and software; it attaches to the

tard Prime streaming-tape control-

The software is said to be command-identical to Prime's MAGSAV/RST, without modifications to Primes, the Prime operating system, or Prime utili-

Gigasav carries a price tag of approxi-mately \$10,000. T & B Computing, 1100 Eisenhower Blvd., Ann Arbor, Mich. 48108, 313-973-1900.

Power supplies

07110, 201-661-3434.

Nova Electric, Inc. has announced the On-Line 3- and 10-kVA uninterruptible power supplies (UPS) for computer sys-tems and process control systems applica-

The units are mounted on casters and saure 22 by 22 by 37 in. high. Pricing for the products ranges from \$6,495 to \$8,495, with approximately eight to 10 weeks required for delivery. Nova, 263 Hillside Ave., Nutley, NJ.



Decision Data Computer Corp. has unveiled an uninterruptible power supply (UPS) that provides up to 20 minutes of 200-watt standby backup power for small ster systems, the co Designated the DDCC 5920, the un

Designated the DIACL SW20, the unit features output protection provided by a 20A fuse in the inverter primary circuit and input protection provided by a 3A line fuse. Normal mode I/O is 102 to 127 VAC; maximum transfer time is reported-

ly haif a cycle.
The DDCC 5920 costs \$295 The company also introduced the 5953, a compact, on-line uninterruptible

5953, a compact, on-line uninterruptible power system that was designed for use in a IBM System/38 MIS environment. Ten 5953 models in 10-, 18-75 and 25-kW, since are available and provide 190/2000 or 271/400 input and output voltage. Other features include quiet ovoltage, other features include quiet ovoltage in access of 300% of UPS capacity. An internal maintenance bypamick in a long provided, and a reasons estatus panel may be purchased to disp critical information up to 1,000 feet fr

the UPS. Pricing starts at \$21,950 for 10-kVA odules; 10-kVA sidecar batteries cost \$2,850.

Decision Data, 400 Horsham Road, Horsham Pa. 19044, 215-956-5736.

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Executive Park, 2 Executive
Drive, Fort Lee, N.J. 07024.

Development tools

new version of the Domain/

As new version or the Domaini, data Development System as been announced by Apollo Computer, Inc. Reported enhancements to be company's 2.0 release in-lude an improved debugger that tilizes windows; a mouse and

hics; and integration cap es with the Domain Perfo

nce Analysis Kit software.

Ada is a machine indepe

201-592-0009.

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The Bigger Picture

PRODUCTS -SOFTWARE

System software

A personal computer-based ex-pert system for tuning IBM MYS systems has been intro-duced by Domanaki Sciences. Performance Advisor runs on IBM Personal Computers, PC

XTs, ATs, Personal System/2s and compatible machines; it is reported to be an ideal training tool for novice system program-mers. Help and Why screens are

cluded. Performance Advisor is availle for \$495. Domanski, 16 Colonial Court, owell, N.J. 07731. 201-367-

al, Inc. has amounced an

Adh is a installment of the third in the control of the new U.S. Department of Defense software. The Donasin/Ads system, which is based on the Verdix Corp. Ads Development System, is fully

ted by Apollo. nain/Ada 2.0 costs \$6,000

for two at \$3,900 per copy. Apollo, 330 Billerica Road, Chelmsford, Mass. 01824. 508-256-6600.

A full-function application gener-ator for supporting Cobol appli-cation development has been an-nounced by Sage Software,

lased on IBM Personal Sys Based on IBM Personal Sys-tem/2 technology and the Micro Focus Cobol/2 Workbench, APS/PC reportedly generates applications for either the per-sonal computer or MVS main-

ane environment.
According to the vendor, deelopment is supported from shysical design and prototyping rough generation and unit sting. This can be done totally dependent of the mainframe

The recommended environment for the product includes an IBM PS/2 Model 70 or 80, 3M bytes of extended memory, 640K bytes of random-access memory and a 5M-byte hard disk. APS/PC is priced from \$5,000 to \$7,500, depending on

Sage Software, 3200 Monroe St., Rockville, Md. 20852, 800-

Camp (ADC) software manage-ment system is now available in a sion to run under the Santa uz Operation's SCO Xenix.

Cruz Uperation's SCU Xenix.

The management system has been available on software development platforms at the minicomputer and workstation level, including Sun Microsystems, Inc. machines, Digital Equipment Corp. VAXs and other vessel. dor offerings. The SCO Xenixfigured version of ADC is

targeted to run in a 32-bit archi-The ADC system can be used to develop software in any lan-guage on a variety of Unix and

proprietary operating systems, The ADC system for SCO Xenix costs \$2,500. Pricing for the software on workstation and inicomputer platforms ranges

pending on the model and config Software Maintenance and Development Systems, P.O. Box 555, Concord, Mass. 01742.

series Software Ltd., a software company based in Ire-land, is now marketing its Ada systems development tool set in the U.S.

volved in Ada system produc-tion; it reportedly offers tool support during the coding, prototyping, testing and user inter-face peneration stages of devel-

maid is not restricted by method, maid is not restricted by method, compiler or environment. The product offers support for most workstation platforms, including Digital Equipment Corp., Apollo Computer, Inc. and Sun Micro-

aid is priced from \$13,430 for use in a workstation environment. The documenta set costs \$85.

Generics, 7 Leopardstown Office Park, Foxrock, Dublin 18, Ireland: 353-1-954012.

AGS Management Systems, Inc. his released Version 1.4 of Multi/Cam, the company's computer-sided software engineering misnagement software. The product is reportedly

used in a microcomputer-main-frame system environment to enable system analysis and de-sign, program development and project management functions. According to the vendor, train-ing can be accomplished from one fully automated worksta-

he latest release includes Continued on page 40

nued from page 39 ed documentation and full art for the IBM character support for the IBM conractes set. The product's purchase package life cycle facility has been expanded to include a rec-ommendation report checklist. The Multi/Cam system with five workstations, including the complete methodology library, costs \$97,000.

AGS, 880 First Ave., King of Prussis, Pa. 19406. 215-265-

rematerm Logic Corp. has mounced three new versions of framaform, the company's computer-sided software engi-seering product designed to utomate application generation and maintenance for IBM main-

The products are targeted to-ward business analysts, systems designers and applications pro-grammers, and all three versions are said to be fully compatible

reach other.

Fransform/Developer is entry-level full-function section generation. Transform/Specialist was designed for advanced application genera-tion, and Transform/Expert is d at advanced applicat gement. Each product is around a proprietary data nary, the vendor said.

decodary, the ventor made.

Developer costs from
\$40,000 to \$100,000; Specialist
is priced from \$125,000 to
\$240,000; and Expert costs between \$184,500 and \$355,000.

Transform, 8502 E. Via De Ventura, Scottsdale, 85258.602-948-2600 Ariz.

Intelligent Software Products, Inc. has announced a se ogicware, Inc. has an-ounced an expert system shell ows users to create excurity software system for the

pert systems on IBM main-frames, Digital Equipment Corp. VAX machines and in a Motor-ols, Inc. 68000 environment. Called Twaice, the product reportedly features English-like

ensive explanation facilities and a knowledge analyzer. The pack-age includes the full Mprolog em and is offered with a com ete support, education and

Pricing varies, depending on estem and type of license re-Logicware, Suite 2100, 237 Park Ave. New York, N.Y. 10017.212-551-3536.

Applications pockages

NMC Technologies, Inc. has released Version 2.0 of its Acats Receivable and Cred-Collection (ARCC) software schage for the IBM System/38

The customer's bank account unber, check number and check amount can be transmi ted via on-line cor and written to the System/38. The ARCC program will split the smission into cash batches and automatically apply checks against customer invoices. The product is written in RPG III. A version for the IBM Application System/400 is slated for release

ARCC 2.0 costs \$35,000. NMC, Suite 103, Bedford Sq., 1314 Bedford Ave., Baltie, Md. 21208. 301-653Xenix and Unix operating sys-

tem environments.

Called Sentinel, the menudriven package reportedly se-cures all communications lines wed by the operating system. It also limits users to specified terminals and denies access to authorized users. Features include multiple passwords per user, caliback telephone numbers for modem users, con-trolled access times and allows ble terminals and various log

Sentinel is priced from \$250 to \$350, depending on the oper-ating system and the number of unications lines.

Intelligent Software, 19 Vir-ginia Ave., Rockville Center, N.Y. 11570. 516-766-2867. BBN Software Products

Corp. has announced Version 8.3 of Dataprobe, a time-sedvsis software for east neers and analysts using Digital Equipment Corp. VAX hardware under the VMS operating sys-

The latest release introduces the Flexible File Server, which was designed to give analysts di-rect access to data files not in the Dataprobe format, the company said. The software also eliminates the need to write custom code for time tag, record header ID and data reformatting. Primary applications include data analysis from flight testing,

telemetry and recording sysserospace, automotive and man ufacturing applications.
Dataprobe 8.3 costs \$30,000 to \$75,000, depending on CPU

BBN Software Products, 10 Fawcett St., Cambridge, Mass. 02238,508-873-5000.

\$20,000 to \$70,000. A record management system for machines running under the Xenix operating system has been announced by Specialized Metron, P.O. Box 864840, Plano, Texas 75086, 214-423-Systems Consultants, Inc.
Called Zebu, the product
consists of a screen-and file-defination program that allows the
user to configure and design the

e vendor said. Editing and arithmetic func-

ons are also included within the reen handler. The product can

be used for order processing, pa-tient scheduling, subscription systems and other data manage-

ment haschons.

Zebu with the Xenix binary and documentation costs \$100.

Specialized Systems Consultants, P.O. Box 55649, Seattle, Wash. 98155, 206-367-8649.

The Metron Group, Inc., an authorized MCBA Corp. install-er, has announced a Trucking Software Package that inte-grates with MCBA's accounting

od distribution software for nix-based computers.

rating and owner/operator set-tiement packages. The software also has provisions for vehicle

as claims management.

Metron is prepared to license its software directly to end users

or to cross-license the system to other MCBA installers. In all cases, Metron will support its

own modules within the system.

License fees for the Metron
Trucking Package range from

so has provisions for vehicle aintenance and repair as well

veral modules are incorpo rated to permit a trucking com-pany to handle its entire range of business administration func-tions. These include dispatch,

The SAS System, SAS Insti-tute, Inc.'s integrated system of software for data management, analysis and presentation, is now available for the Hewlett-Packard Co. 9000 Series 800 entry screen. The software al-lows two-level screen definition, function access and on-line data entry by the Unix or Xenix user,

technical computers. SAS System under HP-UX in-cludes logical, modular compo-nents for data-entry retrieval and management; report writing and graphics; statistical and mathematical analysis; and appli-

The software supports HP-UX, which adheres to AT&T's Unix System V Interface Defini-tion 2, and will be distributed on nine-track tape and data car-tridge used on HP's 9144 tape

The first-year fee for ba SAS Software ranges from \$500 to \$7,500. SAS, Box 8000, SAS Circle, Cary, N.C. 27512. 919-467-

Lachman Associates, Inc. has released Version 2.0 of its LAI Security Audit software

ckage. The software now offers a new terminal idle check and en-hanced reporting and configurans, the vendor

Additional checks for com Additional checks for com-mon Unix operating system se-curity bugs are also included, and a password file check verifics login and password integrity. Licensing fees for LAI Securi-ty Audit 2.0 start at \$2,000.

Lachman, 1901 N. Naper Blvd., Naperville, III. 60540. 312-505-9100.







g 256K memory. This is the one you we heard so much about with spale times, small object code modules, not copy protected no., , and clear error messages. Version 5.0 is based upon ANSI 74 to with new dynamics leadures mounting. re requires the software package (threver

Ordering ALTO-Side, SECURITY, LENGTH-CHECK, EMPTY-OHECK, ATTREUTE (color), FROM ES-CAPE KEY, DAY DATE, THE CHYCHECK, PROPERTY OF THE CHYCHECK, PROPERTY (color), Can display error Fact, manager, property of testing of the Chycheck, Pack, Pa available. COBOL source code EDITOR with auto line numbering, A-margin, G-margin tations with full

die from Utsh COBOL, Utsh FORTRAM Utsh



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Itilities

An integrated journal manage-ment and recovery program that was designed to reduce auxiliary disk storage requirements and recreate lost or damaged file has been introduced by Online Software International, Inc. Filesauve/RCS will second-Filesave/RCS will report-

edly assist systems program-mers, data administrators and other operations personnel in ouner operations personnel in developing a recovery system for managing both on-line and batch program journals. The product will also perform for-ward or backward recovery for partially corrupted files, the ven-

dor said.
Filesave/RCS runs in the OS
environment under IBM's MVS
and MVS/XA and costs \$12,500

On-Line Software, Two Ex-ecutive Drive, Fort Lee, N.J. 07024, 800-642-0177.

Chi/Co Information Management, Inc. has released Data Set Analysis System 5.0 (DSAS) and Resource Analysis System (RAS) — software designed for the IBM — soft ucts reportedly operate un-the OS, VS, VM and

be off-site if an application is to be recovered at an alternate lofies the minimum computing resources required to execute one or more applications at an alter-

Both products are offered un-der a perpetual license agree-ment for a one-time fee of \$10,000, which includes docutation, tape and a one-year Chi/Cor, 10 S. Riverside Pla-za, Chicago, III. 60606. 312-454-9670.

dsta administration and ma tenance tool developed for use with IBM's DB2 and SQL/DS has been announced by Intex

software will reportedly perform several enhancement functions, tents, moving or altering data within DB2 or SQL/DS and transferring data to other sys-tems by translating SQL data into a standard format. The pro-

SQL:Docufact pricing de

Monthly license fees range from \$200 to \$500; three-year li-censes are priced from \$6,800 and permanent licenses are available starting at \$7,800. Intex, 161 Highland Ave., Needham, Mass. 02194. 617-449-6222.

Future Generations, Inc. has introduced Image Connec-tion, a software utility designed for use on Digital Equipment Corp. VAX systems running

VMS.

The product allows a software application to be shared by
an arbitrary number of interactive users, the company said.
Each user's screen will reportedby display an exact reproduction every other user's interac-ons with the application. Ter-inal hardware must be applica-

\$995. Future Generations, 5 Propect St., Rowley, Mass. 01969 617-262-8660.

Main Frame Software Pro-ucts Corp. has announce Help/Key 2.0, a program sa to provide sophisticated on-line Help facilities to users of IBM's CICS running under the VSE and

COMPUTERWORLD

software will now support Mod-els 2, 3, 4 and 5 of 3270-type ter-

els 2, 3, 4 and 5 of 3270-type ter-minals, the vendor said. License fees for Help/Key range from \$9,900 to \$12,900. Main Frame Software, 1 Hol-lis St., Wellesley, Mass. 02181. 508-239-0288.

Softouch Systems, Inc. has announced two products for the IBM VTAM environment. VTAM-Windows is a

VTAM sessions manager with interactive windowing. The pro-gram reportedly allows users to work with IBM's TSO, CICS and MOS all on one screen and elimi-nates the need to log on and off between applications.

The software supports as many as nine sessions per termi-

Machine group pricing is om \$7,000 to \$25,000. The VTAM-Express package was designed to perform ter-minal data-stream compression at the VTAM level.

According to the vendor, both inbound and outbound compression is provided for every application in the network, and a sep-

The software supports CICS, TSO, IMS and any other VTAM

application.

Machine group pricing for VTAM-Express is from \$7,000 to \$25,000.

Softouch Systems, 8269 S. Walker, Oldahoma City, Olda. 73139. 405-632-4745.

New Generation Software, Inc. has announced Release 2.0 of Interactive Query (IQ). its report-writing and informa-tion retrieval tool for the IBM

System/38 minicomputer series.
Release 2.0 reportedly includes both the menu-driven and SQL models of IQ support ta-bling and allows users to create substrings of existing alphane meric fields.

Other features are said to in clude improved report format-ting, command-key access to SQL from the menu-driven mode and a default maintenance

according to the vendor, the software supports easy file joins of as many as 32 files, with sort-

of as many as 32 lines, with sort-ing, sequencing and selection of records using Boolean logic. A single-site license for Inter-active Query 2.0 costs \$8,000. New Generation Software, Suite 195, 1010 Harley Way, Sacramento, Calif. 95825. 916-920-2200.

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MICROCOMPUTING



Waiting and waiting . . .



pite the annoyances of design ors, performance problems nd bugs. Others become far too at-

tached to programs that have anced but not ped. These folks start to get more than a bit frustrated as

the west stretches on Lotus' 1-2-3 Release 3.0 is a case in point. After the latest six-month delay was announced, rs seemed to feel a bit hurt

sunk in: It was as if these people were actually engaged to this program and were desperately ng for the relationship to With some cheapo Radio Shack equipment, it was easy to listen in on a conversation be-

tween a Lotus customer and a sales rep, especially since both re imaginary.
"Hey, LDC. You know how

d I am, don't you? Well, hen can I get some, you know, ase 3 action "Oh, now, User Joe. You w I can't let you have it until Continued on page 49

Program — training = problem

End users' enthusiasm can lead to dublicated programming, glitches

BY MICHAEL ALEXANDER

Put a bunch of personal computer users in a room and eventually they will duplicate every application ever written for themselves and their departments. At the same time, they will create every type of headache for the information center manager down

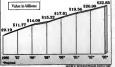
Thanks to the proliferation of personal computers and a rise in computer literacy, more end users than ever are creating applications using programming lan-guages, databases, spreadsheets and other programs. The applications backlog at many MIS de-partments, and the desire to get

But the problem is that end ers are not computer systems people, pointed out Martha Duke, information center manager at Union Pacific Resources in Fort Worth, Texas. "They are ants, lawyers or whatev er, and computers are not their primary job responsibility, so they don't apply the techniques that are ingrained in the profes-sional programmer," Duke said.

Most end users are not ade quately trained for applications development work and fail to document audit and test their cations. Often, the applications are more appropriate for

around it, is also speeding end-

Data View The allure of Europe kipments to Western Europe is expected to top \$22 billion by 1993



nal computers. When there is little communication between departments, end users may be painstakingly duplicating appli-cations that are readily available elsewhere, said Richard Daniels. a senior systems analyst at Ciba Geigy in Greenshoro, N.C. Compounding these problems is the fact that end users are

pressing demands for more sup-nort and guidance from informaion centers to help them imple nt the systems they develop.

If they do not create docutation and other critical information, when employees leave the company they often leave problems behind, ex-plained Rich Slade, group leader in user services at Argonne, to tonal Laboratory in Argonne, IE. "When the new end user comes to us for help, we don't

know anything about the applicahe said. The result is money down the drain. Duke said, "We had to

abandon a small local-area net-work that an individual had helped set up because there was person hired a consultant who did the initial programming, and the end user made changes later. It caused a lot of headaches when the individual left."

Eventually, the local-area network was dismantled and the salvaged hardware was sent to

er departments, she said. Even so, the loss amounted to peveral thousand dollars in lost It is after this sort of cata-Continued on page 47

Rbase aids in murder victim ID

BY STEPHEN JONES

SEATTLE - When you think of database management pro-grams, you think of corporate accounting and massive files of data. But when Microrim, Inc. thought of its Rhase database system, it thought of crime — a rash of 40 serial killings in Seat-tle known as the Green River

Microrim Chairman Wayne Erickson developed a microcon puter database application that elps match dental records with the remains of unidentified mur-der victims. Erickson teamed up with forensic dentists to write the program after Redmond, Wash-based Microrim was approached by Dr. Donald Reay, the medical examiner for King County in Washington, and the police task force working on the

Continued on page 50

Manzi, King tell why 1-2-3
 Release 3.0 is late again. Page

Caper helps special-ed stu-dents. Page 45.
 CC:Mail built to work in

rain, enow, sleet and dead of night. Page 45. • Hyundai unveils PC XT compatible. Page 51.

How Micro Focus COBOL helped the U.S. auto industry get up to date with Just-in-Time Manufacturing

In 1984, Ted Annis and Guil Jackson founded Supply Tech to develop software that would provide communication of business documents between parts suppliers and the major U.S. automakers.

With the release of its STI product, Supply Tech wan use resease or as 311 product, Supply leen had the cost-effective application that suppliers needed to service the Big 3 automakers' mandate for Electronic Data Interchange (EDI) software to make Just-in-Time

manufacturing possible.

Annii and Jackson agreed that COBOL was the right choice as their development language. "When us properly COBOL lends itself to self-documentation where

properly COBOL leads itself to self-documentation whis means easier implementation so domaintenance.

Jackson, Supply Teols President and head of product development, use already familiar — and disastisfed — with another COBOL but Micro Focus COBOL had the mainframe COBOL commands they needed. "Micro Focus also offers additional capabilities via standard rootines so that you can do most thisgis in via standard rootines so that you can do most thisgis via standard routines so that you can do most things in COBOL that you can usually do only from a lower-level nguage," Jacksoo notes. "And no matter how technically phisticated they are, our mainframe programmers just crazy over the Micro Focus Editor and ANIMATOR."

Supply Tech's new STX12 product is a generic EDI system that is opening up new markets for the company-productivity increases from Micro Focus COBOL have made it easy for Supply Tech to expand its product line.

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After exercising your grey matter with a few hundred "what if's" every day, it's nice to have a no-brainer to deal with. How's this: for every Lotus 1-2-3" Release 2.01 you buy on or after Septem-ber 6, 1988; you get a free 1.2.3 Release 3° will be the most powerful spreadsheet on Upgrade as soon as it's available. (Be sure to save your proof of purchase.)

Easy decision. After all, 1-2-3 Release 2.01 has recently been rated the top-performing

spreadsheet for an unprecedented fifth straight year by the NSTL! In fact, 1-2-3 is the backbone of business, with over 7 million users who depend on it everyday.

the market by far, yet it will offer the familiar 1-2-3 interface and be fully compatible Lotus sales rep for details. with all your present 1-2-3 data, macros and applications.

The new 1-2-3 will offer an exciting

3-dimensional spreadsheet for better organization and consolidation of data. Plus, improved graphics and powerful database enhancements, including the ability to access external databases. like dBase*, from within your spreadsheet. See your Lotus Authorized Dealer or

SMALL TALK

William Zachmann

Searching for stars



e past few years to the acceler ng transition to a new era of rmation systems. I will now, as president of my own compa-ny, Canopus Research in Dux-bury, Mass., aim to take a more direct and active role in helping users, vendors and the fi community to take advantage of that transition and to avoid its

Personal computers and workstations based on microprocessors local-area networks, network servers and multiuser, multiple microprocessor-based systems are more than just low-end system nts. They are destined not merely to supplement but to re-place traditional mainframe and even minicomputer systems based on proprietary architec-

tures over the coming decade. Innovative, leading-edge systems are already moving into territory that was once the exclusive domain of traditional sys-tems. Early in the 1980s, the ned systems from vendors uch as Altos Computer Systems began to replace low-end minis for small business applications.

Over the past half-decade, reducts such as Stratus Computer's more powerful mul-tiuser fault-tolerant systems Continued on page 50 Jucqueline Haynes shows off CAPER

Why Release 3.0 is still on hold

Lotus' Manzi, King explain why upgrading 1-2-3 is not as easy as X-Y-Z

INPERSON Lotus Development Corp.'s 1-2-3 Release 3.0 is the most important pro lact Lotus has crea

since the original 1-2-3. The user base has already been pre-pared for its release with brief-ings, a free upgrade policy and wfull-page advertisements. The only problem is that Lonew full-page ad

tus' 1-2-3 Release 3.0 has yet to ship, and now Lotus has told the world that the schedule has slipped again. Instead of having lease 3.0 for Christmas, users

will have to wait until the second quarter of next year. ment, Computerworld Senior

Editor Douglas Barney was on the telephone with Lotus Presi-dent and Chief Executive Officer Jim P. Manni and W. Frank King, software products group senior vice-president, to find out what

and the free upgrade program. How did you dete ine the new timetable? ng: First of all, the upgrade the industry. We think it's the right thing so the custor ahead and continue to buy Re-

doing. And we have to be doing other things along that line to maintain and increase the value

It was apparent to me that we were not going to have the bugs closed down by the end of the quarter. We've made a lot of pro-gress, and we do have a single version of both DOS and OS/2

running single-source (code).

The worksheet size wasn't getting to where we wanted it to get to. We have the ideas and the get to. We have the ideas and the techniques to get it there, but it inn't there. The last thing we want to do is ship something that doesn't have quality and perfor-mance and worksheet size. So it's just a matter of watching the vital signs and concluding that

we weren't going to get there by the end of this quarter. To what extent are other projects contingent upon Release 3.07 For instance, does the graphical 1-2-3/G use the Release 3.0 Continued on have 46

ase 2.0 at the rate that they're Expert system cuts diagnosis time

BY MICHAEL ALEXANDER

When a child in elementary school is having difficulty learning to read, it may not be bese he has a had attitude or disshility. It may be because he is

not recognize the problem for what it is and instead refer the child to a special education program

The teachers are overwhelmed, and special education is one of the few places to get

the ch scroom," explained Jacqueline Haynes, a researcher at Intelligent Automation in Rock-ville, Md. Haynes is also the developer

of an expert system called Com-puter-Assisted Planning for Eduational Resources, or CAPER designed to help elementary school teachers and administrators more accurately diagnose pupils and plan instructional programs for them.

"CAPER was developed to help children who are education-ally at risk, including those who are having trouble adjusting to mainstream American schools; who are culturally different from many of their classmates; and who are not proficient English speakers," Haynes said. Schools are devoting consid-

erable resources and personnel to administrative and referral meetings to determine whether s particular child should be

well as a shuttle bus, to drop off ation packets to remote

aced in a special education setting. Administrators often dis-cover that if the teacher is unable to work with children with limited English proficiency or socioeconomic problems, he is apt to recommend that the children be placed in special education just to get rid of them.

Helping educators "Too often, many of these kids

are referred for special education and identified as handi capped because teachers and school administrators do not have the knowledge or time to analyze complex individ tions and determine the best in structional plan for each student," Haynes said. "We saw the opportunity to build an expert system that would deliver relisble information and sound rec-ommendations to elementary school personnel."

The expert system, which was developed using the Knowledge Engineering System from oftware Architecture and Engi-Continued on page 48

CC:Mail a big hit with LAN users r of different types of LANs.

BY JULIE PITTA

PALO ALTO, Calif. - Corporate computer users weary of playing phone tag with co-workers are getting a respite with electronic messaging packages such as CC:Mail, produced by

CC:Mail, Inc.

Bruce Pryer, a senior consultant for end-user computing at
Baxter Healthcare Corp., is in
the final stages of a project to install an electronic messaging
system that will accommodate 00 users working on 180 loo, users working on 180 to-cal-area networks at the firm. After comparing CC:Mail to oth-er electronic messaging pack-ages, Fryer's group chose it as a standard.

"It requires minimal train-ing." Fryer explained. "It has a red with other E-mail sysas, and it is designed to handle very large systems [with] thou

Another deciding factor in the lection of CC:Mail was the product's ability to run on a num

CC:Mail Price \$695

Because of its size, Baxter Healthcare uses a variety of LAN products and requires a software package with Bexibili-The National Academy of Sci-ces in Washington, D.C., is in

the business of compiling and disseminating information. The emy - which boasts a er of branches, including number of branches, including the National Academy of Engi-neering and the National Acade-my of Medicine — has been commissioned by the federal government and private indus-try to compile reports on a vari-

Prior to purchasing an tronic messaging system, the Academy was hampered by its

there's a need to pass a lot of it around," said Kit Davis, technol-ogy manager of personal com-puter systems at the Academy. Continued on page 49 We deal in information, so

Picky, picky, picky

only to have it not work? Well, only to have it not work? wen, if you are a user of Lotus De-velopment Corp.'s 1-2-3 spreadsheet package, the answer may be simple. Pass words in 1-2-3 are case-sensi-

word-protected file, you must

enter the password who un-same uppercase and lower-case letters used to create it. This is a common reason for the error message "Invalid

Release 3.0 FROM PAGE 45

: Release 3 core code is used me of the products. It's a set of functionality that I it is the basis for the IBM

On the other hand, G [1-2-G] is a separate development doesn't share that same core

s wouldn't affect the of 1-2-3/G? hat's correct. They're in

ald 1-2-3/G actually p close on the heels of lease 3.0 so a user could osse either on MS-DOS OS/2 version of Resea 3.0, or go wholeg and use 1-2-3/G in Presentation Manag-

g. We're really building a sadsheet family. We have Ro-e 2.0 for the 8088, 8086 XT-a machine. We've said we're g to keep that valuable asset 286 class of machine, where there's 640K up to a couple of megabytes. There are a lot of machines being built today with that capability, and basically those machines can either go DOS or OS/2.

OS or OS/2.

And G is really aimed at the gher end of the marketplace, achines that are 286, 386 with the higher megaherts and Prentation Manager environment. There, we're finding—
that the forestromers are funing.

and a lot of customers are finding — that it requires 5M to 6M tes of memory to start to de teresting stuff. So these three products are aimed at the three tiers of the PC marketplace, and therefore we intend them all to be in the marketplace simulta-neously. We also intend to proneutry, we also intend to pro-vide upgrades so if a customer goes from an XT-class machine to an AT-class machine, or goes from an entry 286 to a high-end

5, they can upgrade. What will Lotus do to con-ince customers who may to teatering a bit to stay in Letus family?

Mannz: We don't find a lot of te-tering going on. We find people looking at competitive products. But since January, worldwide, our sales organization has been in front of about 370,000 cus-



3.0. We're not seeing any whole-sale shifting in that terrain at all extraordinarily

ed with what we're doing and with what we're show em and are hooked into th rategy across the PC base.

hat would include things sch as Blueprint — the rta access specification - Lotes Extended Appli-tion Facility and then a hole evolution up to make lity to do coi: Yes. It's also important to remember that, you know, while we're doing this, every-body still thinks Release 2.0 is

way with their user survey, and NSTL [National Software Test-ing Laboratory] just voted it that way. So what we're really doing

We really are. We help Mansi: We really are. We help and work with and encourage those companies. Have you seen the quality of output that you get with the new Funk Allways (a new spreadsheet publishing add-in? That is useful to us and keeps the product really valuable.

Are you going to be ship-ping the beta version soon, so people will have an idea of where you are and how this thing is mov-King: We had a workshop with about 25 customers a couple of weeks ago. They brought their files and worked with the prod-

to some extent.

uct, so we're already doing that What beta means to us is that the product is really ready to be tive in an environ

ate. We're not going to do that until we get the product to the level that we need it to be.

But we are already works with customers here at Ca bridge so that they can use the product, test its competibility. see the function, and the

As you move some of the code back from C to as sembler, does that make sembler, does that ma the job of porting it to of

King: No. The way we do that is that the base code is all written in C. And then when we move it to a DOS or OS/2 environment. certain code, 5% to 8%, gets

certain code, 5% to 8%, gets written in ascenbler. When you move it to the IBM MVS environment or to a Unix environment, it is a different set of code that gets rewritten to whatever the local assembler is. But the base is all kept in C. The common library is in C. We do all the development there and then just incrementally tone to the specific operating environment.

then just incrementally tune to the specific operating environ-ment. That is a major break-through of this development. I don't know of any piece of code in the world today that you can possibly find that russ on

the best spreadsheet on the mar-ket. PC World just voted it that It's About Time You Means To Effectively Manage

Ten million dollars is the minimum investment in application software systems at most Fortune 1000 companies. Whether vendorsupplied or in-house developed, it's likely that your organization's software investment is even higher.

Effective methods to manage these critical assets have been elusive at best. We all can relate to the difficulties of responding to change requests, preventing failures when changes are made to critical systems, overcoming audit exceptions and quantifying the size and scope of both our software inventory and application development efforts. all your software systems from inception through production-

Until now, Information Systems (I/S) organizations like yours didn't have an automated means to effectively manage the creation, evolution, distribution and operation of these corporate software application assets.

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also a couple of others.

Vill you either add or t King: We are not going to add or trim. What we're really doing is focusing on the bugs and the product tuning.

How does this affect specific products such as 1-2-3/M, 1-2-3/Mac, 1-2-3/Unix and the 3/Unix and the Letus/DBMS strategy? King: The Lotus/DBMS strategy is built on the platform that is

gy is built on the platform that is the set of code that runs on top of the OS/2 Presentation Manager. That platform is shared with a collection of tools that includes the spreadsheet, database tools and some other tools. But that'a all an independent effort. So that whole strategy and that whole platform and the tools that run on it are parallel independent de-velopment efforts.

d Blueprint is not de-ndent upon Release King: That's correct. Blueprint is an architecture, and we're im-

King: We haven't announced any dates there. We have that prod-

What about the other products? 1-2-3/M, 1-2-3/Mac and 1-2-3/Units? King: A key point that we feel about Release 3.0 is it is such a arge development activity it is large development activity. It is 339,000 lines of code. It is not something that is clonable by any someraing that is conside by any of our competitors. It's going to set the base for a long time to come. It's a level of investment and development sophistication that is not going to be matched.

It is worth the wait? King: Yes. And it's an invest-ment that only a company with the resources of a Lotus could

What has Lotus learned from this experience? Manzi: We've learned that when u start a process that is trying define the world of software in e future, both from the tech-

ity standpoint, maybe it will take a little more time than we thought. We need to be a bit more mast about how we assess those things. And clearly it be-hooves us to keep some of the in-formation about timing to our-

Problem

FROM PAGE 43

atrophic event that information contain managers appropriate the need for setting up and following guidelines for developing their own applications, Danielon noted. An some personal computers are linded in networks and con-tain the contract of the contract of the con-tract of the con-tract of the contract of the con-tract of the con-tr

three phases in the evolution or end-user computing.

In the first phase, PCs enter the company as stand-alone ma-chines, be said. "If end users are developing their own applica-tions, they are for their personal use and not likely to have much

their departments, operational controls begin to take on impor-tance. In the third phase, in which end users are developing applications using LANs as plat-forms and sharing data and appli-

Despite the pot problems that can ari oblems that can arise from al-wing end users to develop their on applications, information

Information center managers typically have standards for purgrams, how those programs are to be documented and who has to be documented and who has responsibility for maintaining, according to Dave Douglass, edi-tor and publisher of "IC Strate-gist," a newsletter covering in-

"You have to be conscious that it can be a problem and set parameters to control it," said Gregg Brown. avaluation and set

parameters to control it," said foregg Brown, systems manager at United Telephone of Ohio in Mannfeld. "But you can control it only so much." End users who have a high level of technical ability can de-welop applications that meet their specific needs and go be-yond what the information cen-ter can provide, be said.

The trend is to provide e users with as much computed power as possible, Brown adde "We do not discoura; them," Argonne Labs' Sta-said. "Our role is to educate es

efit of end users devel

center managers for managers center managers for manage end-user applications developed, scording to "IC Stra-gist," include the following: e End users who write appli-tions are responsible for se

Company Had The ne Of Its Most Valuable Assets.

whether they're traditional, 4GL, CASE or DBMS-based. The ENDEVOR software management system provides for:

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applications from test to production to remote sites.

ark, 114 Turnpika Road, Westborough, MA 01581-9990 OCTOBER 17, 1988

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And ask us how ENDEVOR has

already helped over 150 top installations like yours manage that elusive yet critically valuable asset - application software.

Expert system CONTINUED FROM PAGE 45

ring, reduced the number of administration and referral meetings in one

ol by more than 50% and received we reviews from school administrators of faculty members, Haynes said. CAPER is a family of 14 expert sys-ms, each with two components. The

st component, the problem analyze fines the pupil's problem in the cla

"The problem may be that the es not speak English, is impo-es not read well, is not more not read well, is not motivated, d do homework or is withdraw re out what the problem is [without CA-PER], particularly because standard tests are not valid for students that do not h. In fact, the tests are not ex magness. In fact, the tests are not d for the student who is not a native

rotogic selector and component, called the strate-tor, offers suggestions ic selector, offers suggestions for resolv-ag the problem as well as guidelines for tops to take in the referral process. commending a change in seating as-sents so that students are seated more compatible classmates or rec-ending a reading program that in-

cludes oral discussion.

"The system may make the teacher aware that if the child is very inattentive aware that if the child is very mattentive in class that hunger could be the prob-lem," Haynes said, "or alerts the teacher that the child may be acting this way be-cause it is normal in this child's culture. A lot of emotional problems are due to cultural differences, and the system sensi-tizes the teacher to this fact."

No cure-all The system does not handle every sort of

The system does not handle every sort or problem; it is designed to resolve prob-lems related to reading, classroom behav-ior and language and cultural differences. Problem-solving components for math, study skills or motor skills, for example, will be a thick better if shiftinger family or an will be added later if additional funding to be found to develop the system further.

Haynes and her colleagues began de-veloping CAPER in October 1985 after receiving a grant for funding from the U.S. Department of Education. Work on the project began when Haynes was a research associate with the Institute for the Study of Exceptional Children and Youth at the University of Maryland's Depart

During the first year, the CAPER team validated and tested modules of the ex-pert system with teachers, administrators and other education experts. The sites in elementary schools in the Washington, D.C., area in January. The system, which can be configured for the charac-teristics and educational objectives of dif-ferent schools, is also currently undergoing testing at school systems in

monytrana.

CAPER runs on an IBM Personal Com-ter XT or faster class of personal com-ster with 640K bytes of random-access emory and a hard disk drive. One advan-ge of using Knowledge Engineering ratem as the shell for developing this ed other expert systems is that it can be rted to a wide variety of platforms

Symbolics releases Mac board

BY JULIE PITTA

CAMBRIDGE, Mass. — Symbolics, Inc.

as introduced an add-in board for s bolic processing applications on Apple Computer, Inc.'s Macintosh personal

computer.
Under a reactier agreement with Apple, Symbolics will market the Motorola,
Inc. 68020-based Macintosh II with the
add-in board and specialized software consisting of LISP code that runs on Symbolics' Ivory processor and C code that runs
on the Mac. The Macivory system features a Mac

II with 1M byte of random-acce

II with 1M byte of random-access memory, a mouse, a 12-in. monochrome monitor and a 300M-byte hard disk drive with a small computer systems interface. The complete system, including add-in board activares, is prized at \$23,000 and in scheduled to be available by year's end. Symbolicus well also sell the board-set and software. The price of the board set and software. The price of the board set 310,000 it is scheduled for abspraced in

March 1989.

Macivory can run existing Mac soft-ware packages and Symbolica applica-tions including Joshua, a software product that builds and delivers expert system ap-plications; Concordia, an artificial intelli-

gence product for hypertext docum development and delivery; and S-Geor try and S-Dynamics, which were design to create and animate two- and three

to create and assumed to create and assumed to the formation of marketing for Symbolics, said Macivory in the company's first FC-related hardware product. Its only other PC-related product. uct is Cloe, an applications development tool for Intel Corp. 80386-based micro

computers.

The Mac was selected as a platform because of its appeal to Symbolics' customer base. "If you look at the markets we play in, those customers are more in-terested in the Mac than the PC," Cannon plained. "It providés us an easier pen

What you've been doing.





If the screens on the right look more intriguing to you than those on the left, you're ready for Microsoft* Windows. Windows opens up the world of visual thinking to all 286 and 386 owners by

offering the power of graphics. Everything you can do on your PC, you can now do better, faster and with greater imagination. Whether you're creating documents or trying to get a clearer

picture of your work.
What used to take complicated key-strokes can now be accomplished with the simple click of a mouse. With Microsoft Windows, you access pulldown menus. Simultaneously work with different programs as well as cut and paste between them to create graphic examples within different bodies of text. And what you see on the screen will appear on your printed page. And once you've learned Micro-

soft Windows, you'll have the basis for scores of other programs because all the countless new Windows applications are based on the same easy, logical format. Since Microsoft Windows virtually looks and works like MS OS/2

Presentation Manager, you won't have to worry about it becoming obsolete in a couple years. We made both systerns compatible. So, in the future, you'll be able to share data between them. And your knowledge of Windows will give you a jump on learn-

ing MS OS/2 Presentation Manager You'd expect a program this powerful to require a more powerful machine. But we consistently create software that makes

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The Information products have been used countries of their respective deviations. Lotte and 1-2-3 by Loten Development Corporation, World Prefet Corporation, Page Valein by Addin.

Barney

CONTINUED FROM PAGE 43

ket, LDC, you promised I'd have it

now."
"Well, Joe, it's worth the wait. And ve me — no one else has got it el-

They'd better not. Say, can I have st a peek at what I'm m re, loe. You can look all you was ast don't touch the keyboard

It's no wonder User Joe slips out at ight to play with the "easy" packages, ke Excel. This is getting painful. ill is beautiful. Ever wonder why all this great software Computerworld keeps writing about hasn't arrived? The answer is simple. The software vendors are putting too much effort into the

It sounds stupid, but like so much in is industry, it's true. It used to take s

is mousery, it a crue, it used to always apie of people in a garage, two tons of susage pizza and a pond full of People to whelp ground-breaking software. Now these same packages are being shaced by teams of well over a bundre grammers, fueled with fancy B-mail, to choose and Perrier. Add to that far many marketing people gathering cklists of functions that users abso-ly do not need, and schedules strets

won't fit in 640K bytes.

one was aumouse to man-price sums try-insider newsletters must have no-ticed a disturbing trend. Once these foll start getting quoted as experts, they fee beholden to give computer bigwigs ad-vice. That's OK. God knows, these peo-

ple need the help. It's just that the form advice is getting a bit irritating. Instead of just giving advice, these

newalette writers pen open letters to the likes of IBM's Bill Lowe and Apple's Joh Sculley. In these missives, the newalette writers give their readers the same ad-vice as the recipient. But Bill Lowe or

John Sculley won't get this advice that "may well save their companies" utiless they subscribe to the newlatter. If this advice is no great, why haven't the board of directors of companies like IBM and Apple hired these guys to run their out-fate."

Recently, I met with an "industry fig ure" and mentioned that someone had written him an open letter. Because he had been traveling, most of the world re the letter before he even got to it. Talk

shout an invasion of privacy.
You know why these open letters are growing out of control? It's just one more way to save ou postage.

EISA irritation. As if IBM wasn't bad enough, a famous board maker now has a few gripes with the way Extended Indus-try Standard Architecture members work with third parties. It seems that in order to develop boards for this new bus, vendors will have to pay \$2,500 and sign a confidentiality agreement. Under this ent, any inventions or ideas that board makers come up with automatically become property of EISA. So much for an open system, and so much for creativ-

Compaq does it too. While Compaq beats up on IBM (someone's got to do it) for propagating an incompatible bus (Mi-cro Channel Architecture), few realize cro Channel Architecture), lew rennae that Compan has been cranking out some different buses of its own. In fact, the new Compan Deskpro 386/202 has a different memory bus from the firm's other 47 386 machines. As with the MCA, if you want to create a special memory board that takes advantage of this bus, it's going to take some effort.

Ain't so smart. How many com journalists (who work for other p ns, of course) does it take to start up a PC? Two: one to watch the machine, a other to get help. That's why they're journalists and not information center

CONTINUED FROM PAGE 45

According to Davis, an estin

users communicate across 10 LANs lo-cated in three buildings via CC:Mail. "Ev-eryone's addicted to it," Davis said, atbuting this to the system's case of use. On the day he was interviewed, there ere 1,000 active messages in the sys-

m, Davis said. International Thomson Co., a \$3.5 bil-lion publishing company based in New York, uses CC:Mail to communicate with 26 offices around the world. Rich Spitz,

so unces around the world. Rich Spitz, manager of microsystems at International Thomson, said he was impressed by the sear with which graphics and files can be imported from other applications onto CC-Mail for transmission to other users. "We used to use fixes, which are slow and sloppy, and ne external mail service that was very expensive and slow," Spitz said.

Although he is pleased with its perfor-mance, Spitz said the price for CC:Mail with a gateway module is expensive at \$1,295 per file server. The product costs

What you could have been doing.



you could have been seeing things much more clearly.



you could have been seeing a lot more things much more clearly.

Companion, ell-ASE ID PLUS by Ashino Tate Companion, Network Companio for Communication Incorporated, Managenia by Managenia, Incorporated, Park Advance by Program Seasibilities, Incorporated, Packade is a tradement of Princip Software, CFO Advance is a tradement of Passacial Funcion

the best use of your present hardware. For example, Microsoft Windows/ 286 will work with as little as 640K and

instantly make your machine more sensitive, intuitive and

highly visual. It gives you the ability to nın every Windows application available. And with access to all those powerful programs, you'll be able to extend the life and usefulness of your 286 well beyond the introduction of

MS OS/2 Presentation Manager. With version 2.1 you also get the benefit of increased speed. So you'll blaze through Windows applications up to 87% faster. Microsoft Windows/386 will give you

everything that Windows/286 gives you. Plus multitasking with most DOS applications. Now you can finally utilize the speed and power of any 386 machine.

Imagine creating a complicated spreadsheet. Then while a macro is being run, open up a word processor. Type a document, open and work with a

graphics pro gram, Out and aste between programs and even call up ectronic mail. And still be able to check on

the status of your spreadsheet at any time. Considering all you can do with Microsoft Windows, you have only one question

to ask yourself. What have you been doing without it?

Microsoft^{*}

Zachmann

CONTINUED FROM PAGE 45

d on Motorola, Inc.'s 68000 fam of microprocessors have begun to chal-lenge minicomputers and low-end main ge minicomputers and low-ent matn-me systems. Stratus computers have en found their way into IBM's produc-is in the form of the IBM System/88. More recently, Sequent has distin-tished itself as a successful innovator

ens based on multiple Innow able to offer systems with process ing nower of more than 100 million instructions per second

Looking ahead, Biin, a joint ver Intel and Siemens, promises further ad-vances in the use of a microprocessor foundation to build even more powerful systems. Biin will carry the attack of microprocessor-based systems into the s percomputer area of computationally in-tensive applications in addition to the area

of large commercial systems. Powerful, larger systems based on microprocessors are clearly starting to challenge what only a few years ago was the exclusive territory of big mainframes the exclusive territory of big mainframes and supercomputers. At the same time,

however, advances in the base technology are making even more inexpensive and smaller systems capable of taking on largand larger tasks.
Full 32-bit processors like the Intel

IIN WILL CARRY the attack of

microprocessorbased systems into the supercomputer area of computationally intensive applications.

386 and the Motorola 68030 are now commonly available in personal computers, making them capable of performance that was until recently available only in much more expensive dedicated workstations. New microprocessor architectures, many of them reduced instruction

set computing-based (or RISC-influ-enced), as well as continued advances in the established intel and Motorola archi-tectures, promise to push even further into high-end systems territory in the years ahead.

The result is that traditional ma The result as that traditional main-frames are a species as surely doomed as-were the discouurs when a meteorite his the earth 65 million years ago, sicking up a cloud of dust that ultimately changed the climate. The turbulent waters of the computer industry over the next few years are likely to nink many older ships long believed to be as unsiniable as the Titanic.

ns is president of Canopus Research, a per industry research firm in Dunbury, Mass.

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use the same bus. The system archite also provides a radical increase in data-transfer rates when the Tandy 5000 MC is configured within a 3Com® workgroup or mul-

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Radio Jhack COMPUTER CENTERS

Flexible Grid laptop debuts

FREMONT, Calif. — Grid Systems Corp. has introduced a new Intel Corp. 80386-based laptop aimed at end users who need

both power and flexibility.
The Gridcase 1535 EXP is a batterypowered laptop with a removable tray with two IBM Personal Computer XT and

with two fBM Personal Computer XT and AT expansion slots for mass storage, communications and other plug-in boards. The expansion slot will enable profes-sionals in the field to configure the laptop for hundreds of applications such as con-verting the unit into an oscilloscope or adding optical disk drives, the company

The laptop, which weighs 16 pounds with the expansion tray, features a 40M-byte hard disk drive, 1M byte of random-access memory and backlit LCD.

access memory and backit LCD.
Options for the unit inchese a gas plasma display, 2,400 bit/sec. internal modem and Intel 80387 wash coprocessor.
The company said it will begin delivering the unit in December at \$7,495.

Rhase aids CONTINUED FROM PAGE 43

King County police believe the marder of 40 women and disappearance of eight others in linked to one perspectator. Identification of many of the women, who chees in the control of the co

is a match, a dental expert compares the missing person's dental chart against a victim's teeth to make a positive identifi-

The system is designed specifically for use in the Green River investigation but is flexible enough that it could be used to identify a second to the could be used to entify remai s in the event of a natural disaster or similar emergency, Reay said. desaster or similar emergency, Reay said.
Microrim is no stranger to law en-forcement officers. The Los Angeles City Police Department used an Roses applica-tion to store and compare data related to the "Night Stalker" serial killings. The Dade County Police Department, in Flori-da uses Rosse to maintain 25,000 active

NEW PRODUCTS

Systems

A 10-MHz IBM Personal Computer XT mpatible machine has been announced Hyundai Electronics America. The Super-16TE is an enhancement of the company's 8-MHz Super-16T and re-places that system as the product line's the cor

The Super-16TE is based on an Intel
Corp. 8088-1 processor and includes
640K bytes of random-access memory. The system also offers five expansion slots, one parallel port and one serial port, se clock and support for both 31/2 and 5%-in. floppy-drive formats. The product comes bundled with Alpha Software Corp.'s Electric Desk, an integrated software package said to include word ocessing, database and spreadsheet functions

The Super-16TE is priced from \$1,045 to \$1,645, depending on system

Hyundai Electronics America, 4401 Great American Pkwy., Santa Clara, Calif. 95054, 408-986-9800.

AST Research, Inc. has added a model to its line of Premium/286 IBM Personal Computer AT-compatible PCs.
The 10-MHz Premium/286 Model
140V comes standard with a proprietary
16-bit graphics adapter and 1M byte of random-access memory. The system also

ships with a 40M-byte hard drive, one serial port, one parallel port and seven exnsion slots, the vendor said.
The Premium/286 Model 140V costs.

AST Research, 2121 Alton Ave., Irne Colif 92714 714-863-1333 Advanced Logic Research, Inc. has introduced two Intel Corp. 80386-based

computers designed to compete directly with Compaq Computer Corp. a 386-20E machine, the company said.

The Flexcache 25386DT Model
120E and Flexcache 20386DT Model
el 120E run at 25 and 20 MHz, respectively. The zero-wait state systems have a 120M-byte enhanced small device inter-face (ESDD hard disk drive with a 1-to-1

ratio interleave ESDI controller. An IBM deo Graphics Array card is available.
The Flexcache 25386DT Model 120E
sts \$7,590. The 20386DT Model 120E

lists at \$5,590

Advanced Logic Research, 9401 Jer-imo, Irvine, Calif. 92718. 714-581-

Software applications packages

EKD has announced a software program that reportedly will automate all of a com-pany's business needs on an IBM Person-

Business-in-a-Box can be config-ured to handle marketing, telemarketing accounting, inventory control and pr duction distribution functions, the distri utor said. Features include a rel tabase, a menu system for acce lications and a security system. duct requires 640K bytes of mer 20M bytes of hard disk space, 300K bytes of free memory and a Hayes Microcom-puter Products, Inc.-compatible modem. It may be used on local-area networks

with as many as 30 active workstations. Business-in-a-Box costs \$999. EKD, P.O. Box Y, Selden, N.Y. 11784

Shopkeeper Software, Inc. has re-leased Shopkeeper M, a multiuser ver-sion of its software package designed for medium-size retail operations. The pack-age runs on a network of Apple Computer, Inc. Macintosh Plus, SE or II worksta

Functions reportedly include sale point-of-sale, invoicing, inventory, billis accounts receivable, customer files, fic ng, cash drawer controls and other applications. The package will accommodate as many as \$2,000 catomers and \$2,000 inventory items. The basic package includes one master program and two additional programs for remote workstations. Hard-disks storage and printing capabilities are required for operation. Shopkneper Moosts \$395. Solpheneper Software, P.O. Box \$3010, Tallahassee, Pla. 32315. 904applications. The package will accom

222-8808.

Software Publishing Corp. has an-nounced PFS:First Publisher 2.0, an enhanced version of its entry-level desktop publishing program.

popublishing program.

The product incorporates all of the fea-ures in the original version and includes sproved file import capabilities. The lat-t release is twice as fast as the original rogram and offers support for more than 70 different printers. The product will also accept scanned images, the vendor said. One hundred fifty clip-art images and a selection from the 150 available fonts as selection from the 150 available fonts are included with the package. The soft ware runs on an IBM Personal Computer PC XT or AT, Personal System/2 or co tible and requires a minis

rtes of memory.

PFS:First Publisher 2.0 costs \$129.

Software Publishing, 1901 Landings rive. Mountain View, Calif, 94039, 415-

Marketing Graphics, Inc. has begun to ship Publisher's Picturepak for Wordperfect 5.0, consisting of libraries of business clip-art in Wordperfect Corp.'s WPC vector graphics file format. The collection reportedly consists of 565 pictures, titled the Eye Opener Series, and includes three editions, incluing: Executive and Management, Sal

The series is sold collectively for \$250, and individual editions are available for \$99.95 each.

Marketing Graphics, Suite 210, 4401 Jominson Blvd., Glen Allen, Va. 23060. 804-747-6991.

Lord Publishing, Inc. has introduced a software package for business owners. Called Romstadt's Financials, the product is a financial budgeting and pro-jection program that will run on IBM Peronal Computers and compatible systems.

The package incorporates accounting and financial applications for several dif-ferent industries including retail, real en-tate, manufacturing, professional ser-vices, wholesale distribution and contract services. The product can also be tailor

fications. Ronstadt's Financials costs \$399. Lord Publishing, One Apple Hill, Na-k, Mass. 01760. 506-651-9955.

Action Technologies, Inc. has announced Version II of its Coordinator Workgroup application software, designed to provide tools for writing, delivering and monitoring business communi-

Coordinator ruas on IBM Personal Computer XTs and ATs and compatible workstations and supports Novell, Inc. in Netware and Microsoft Corp. MS-DOS 3.1 and higher local-area setworks, the vendor and. The product's user interface is based on IBM's Common User Access recommendations for Systems Application Architecture. Version II was developed to focus on the activities of a work Coordinator runs on IBM Personal group and provides multiple address delegation, reminders and appointme Electronic mail, scheduling and man ment festures are included.

Coordinator Version II costs \$495 for tand-alone workstations and \$995 for a LAN file server supporting up to 10 work-stations. Other configurations are also available.

Action Technologies, 11th Floor, 2200 Powell St., Emeryville, Calif. 415-



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Deerfield Systems, Inc. has intro-duced Displayform II, a microcomputer software package for forms processing. The product reportedly can display a

orm on the screen in what-you-see-iswhat-you-get format and can also set up forms for data entry. The package will acforms for data entry. The package will ac-commodate both preprinted and electron-ically generated forms and merge infor-mation from Ashton-Tate Corp.'s Dbase III files. An IBM Personal Computer, PC XT, AT, Personal System/2 or compati-ble with Microsoft Corp. MS-DOS 2.0 or higher is required. A hard disk, a high-resolution graphic display card and a printer are also necessary for operation. Displayform II costs \$495.

Deerfield Systems, 221 Elizabeth St., Utica, N.Y. 13501. 315-797-1805.

Data Access Corp. is shipping Office Works, its group productivity software

ogram. The package consists of five indepennt modules designed to support various business activities including phone mea sages, document control, name and address database maintenance, electr mail and time management. The software is available in both single and multiuser versions and runs on IBM Personal Computer, PC XT, AT or compatible systems with 640K bytes of random-access memory and 2.5M bytes of disk storage. The multiuser configuration can operate with Novell, Inc.'s Novell Advanced Netware 2.0 and higher and 3Com Corp.'s 3+ 11 and higher and other IBM Netbios-comThe single-user version of Officeworks costs \$195. The local-area network version costs \$1,395.

Data Access, 14000 119th Ave. S.W., Miami, Fls. 305-238-0012.

Broderbund Software, Inc. has an-nounced DTP Advisor, a Hypercard ap-plication for Apple Computer, Inc.'s Macintosh computers.

intoth computers.

Designed for both entry-level and sophisticated desitrop publishers, the product consists of two programs: a tutorial on
the general elements of graphical design,
and a project management system for
graphical arts projects. According to the
vendor, the software addresses several
areas including layout, typography, preproduction and printing.

DTP Advisor is scheduled for release in the fall and will cost \$79.95. Broderbund Software, 17 Paul Drive, San Rafael, Calif. 94903-2101. 415-492-

Macintosh products A 21-in. gray-scale flat monitor for the A 21-in. gray-scale flat monitor for the Apple Computer, Inc. Macintosh II has been introduced by Sigma Designs, Inc. According to the vendor, Silver-view can display from two to 256 shades of gray when used with several different

display adapters.
The display screen features 1,152 by 860 pixels and offers a 72 dot/in. resolu-860 pixels and offers a 72 dot/in. resolu-tion. The product will be offered in three versions: Silverview M, a monochrome version that lists for \$1,999.; Silverview \$4, which provides 16 levels of gray and costs \$2,499.; and the Silverview S8, which displays 256 thades of gray simul-taneously and is priced at \$2,999.

taneously and is priced at \$2,379.

The company has also announced the Colormax, a 19-in, color display system also designed for the Macintosh II. A maximum of 256 colors may be displayed simultaneously. The mention served displayed of the colors in the multaneously. The monitor screen offers a display of 1,152 by 870 pixels and provides an 82 dot/in. resolution. Reported-ly, the product is especially suited to engi-neering drawings, full-height documents

nd two-page spreadshorts.
The Colormax costs \$5,299.
Sigma Designs, 46501 Landing Pkw remont, Calif. 94538, 415-770-0100.



Designs' Silverview monitor

GCC Technologies, formerly known as General Computer Corp., has introduced the FI/150 internal drive for the Apple Computer, Inc. Macintosh II system. The 150M-byte hard disk incorporates Control Data Corp. Wren III drive tech-

pgy and offers a 16.5-msec average acas time. The product is shipped with all ftware, cabling and brackets and insoctware, cassing and oracsets and in-cludes a full one-year warranty on parts and labor, the vendor said. The FI/150 costs \$2,499. GCC Technologies, 580 Winter St., Waitham, Mass. 02154.617-890-0880.

er application software that al-A multimer application software that al-lows work-group editing on the Apple Computer, Inc. Macintosh machine has been announced by Mainstay of Agoura Hills, Calif.

rums, Calli.
Called Markup, the product reported-ly allows reviewers to mark up, highlight, expand reports, drawings, art and scanned photos. The software supports a physical work group on a network such as







INTRODUCING ZENITH'S NEW BATTERY-POWERED PORTABLES

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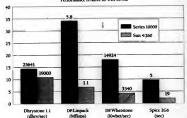


systems

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By the way, if the Series 10000 isn't faster on your application than the Sun 4/260 or VAX/8800, we'll take you out to a very enjoyable dinner. But be warned, we don't intend to be buying many

The Apollo Series 10000 Challenge ends Nov 15. If you want to be part of the challenge call (308) 256-6600, extension 4454. But don't take your time about if Because when you're talking about the Series 10000, things happen fast. Ask about our Series 100000 seminars. Call (508) 256-6500, extension 444-96 for details

Apollo is a registered trademark of Apollo Computer Inc. Series 10000 and Peiscond Supercomputer are trademarks of Apollo Computer Inc. VAX is a registered trademark of Digital Equipment Composition.

apollo

ers relying on disk or n transmission, the product is slated for revenoor said. The product is saited for re-tail channel distribution next month. Markup costs \$495 for a database and a two-user pack and \$995 for a database and a five-user pack. Supplemental Mark-up user packs cost \$195 each. Mainstay, \$311.8 Derry Ave., Agoura Hills, Calif. 91301. 818-991-6540.

Software utilities

press Systems, Inc. has released urbo Apprentice 4.0, a productivity ald esigned to complement Borland In-national's Turbo Pascal, Release 4.0.

The product reportedly expands upon rland's context-sensitive Help feature offering support reference information. by offering support refe use user's units and procedures. The program automatically scans program and library files and indexes information. Users can then receive reference data on a designated item by pressing a Help key. Turbo Apprentice 4.0 costs \$25. Cypress Systems, Suite 175, 11693 for the user's units and procedures. The

Cypress Systems, Suite 175, 11693 San Vincente Blvd., Los Angeles, Calif. 90049, 213-207-3938.

tware Connection, Inc. has re-ed Version 4.0 of DB Files, a library of files designed to manipulate data, memo and index files while maintaining compatibility with Ashton-Tate Corp.'s Dhase III + file structures.

Release 4.0 reportedly includes ver-sions for Microsoft Corp.'s C and Turbo Pascal from Borland International. Source-code versions of the product are available for Microsoft's MS-DOS, Xenix, Unix and Digital Equipment Corp.'s

DB Files costs \$99.95 for the singleuser object version. Software Connection, P.O. Box 712, Ely, Minn. 55713. 218-365-5097.

A DOS enhancement utility with built-in IBM Enhanced Graphics Adapter, Video Graphics Arry and mouse support has been amousuced by The Aldridge Co. Tree86 Version 2.0 eliminates the need to wait for reading-tree and drive in-formation on single or multiple drives, the vendor said, The product reportedly

reads up to 26 drives in memory and in-cludes a context-sensitive on-line help It runs on IBM Personal Computer, PC XT, AT, Personal System/2 and compati-ble systems and requires DOS 2.0 or high-

Tree86 2.0 costs \$89.95 The Aldridge Co., Suite 575, 2500 City W. Blvd., Houston, Texas. 77042. 713-953-1940.

Mountain States Consulting has anced a DOS menu environ IBM Personal Computers, PC XTs, ATs

Called MSC-Menu, the product re-portedly allows users to create their own rating environment by replacing the DOS prompt with intelligent custom nus. The program also provides unlimited menu nesting and linking and single-and multiple-command DOS. Require-ments include DOS 2.0 or higher and 256K bytes of random-access memory. MSC-Menu costs \$29.95.

Mountain States Consulting, P.O. Box 20326, Jackson, Wyo. 83001. 307-733-

Development tools

om Products, Inc. has revised its integrated development system for IBM Personal Computer and Personal Sys-tem/2 machines running under IBM PC-DOS or Microsoft Corp. MS-DOS.

Watcom C6.5 offers increased speed cross a wide area of functions, including ompilation, I/O, string manipulation and semory allocation, the vendor said. Sev-ral additional library functions have been added to the peckage, including a graphics library that is compatible with Microsoft's C5.0. A minimum 512K bytes of memory

Watcom C6.5 is being offered at an in-oductory price of \$295. Regular list

cts, 415 Phillip St., Wa-ds. N2L 3X2. 800-265-

microcomputes on the sign software package modeled on Ten-onix, Inc.'s Teknicad Plot 10 has been onix. The announced by Cad Associates, I product reportedly offers the sar ing capabilities as its mainframe

pany said.
Called Tekmicad/PC, the program-rum on IBM Personal Computer ATs or compatible computers under Microsoft Corp.'s MS-DOS 3.1 or higher. Floating Point Systems, Inc. Floating Point co-

ics Adapter-co

ad/PC costs \$2,995 Teknicad/PC costs \$2,995. Cad Associates, Suite 250, 5840 W. In-terstate 20, Arlington, Texas 76017. 800-338-7147.

A software-based tracking system that al-lows software developers to protect pro-grams without copy protection or altering emisting source code is now available from Ar-Tech Software, Inc.

According to the vendor, Eve ering by prev

portedly allows the developer to place a secure alphanumeric serial string within the program and will build an expiration date into the software to limit the amount of time it can be used. The product runs on IBM Personal Computers and compati-bles under DOS 2.0 or higher.

Evertrak costs \$295. Az-Tech Software, 305 E. Franklin, hmond. Mo. 64085. 800-227-0644.

An educational game designed to acquaint individuals with artificial intelligence and expert system concepts is available from

Called E-KE, the game consists of a ck of cards packed in a plastic case. The cards incorporate if, then, demon and de-cision categories and make use of forward and backward chaining concepts. Illustraes and a glossary of Al terms is in

The game is for ages 10 to adult and have two or four players. E-KE will be available in the fall at a cost of approximately \$10. E-KE, 301 Monteray Drive, Dublin. Ohio 43017, 614-792-9944.

A videotape training program for users of Wordperfect Corp. a Wordperfect 5.0 is now available from Learn-PC Video The program teaches begin e and advanced skills and is available in all video formats, the vendor said. Three videotapes, three guidebooks and a

A VHS- or Betamax-form PC Wordperfect 5.0 tape costs \$895. A %-in. U-Matic tape version costs \$1,045. Learn-PC Video Systems, 5101 High-way 55. Minnespolis, Minn, 55422, 800-

oard-level devices

Creative Solutions, Inc. has an-nounced four interface boards that were designed for users of Apple Computer, Inc.'s Macintosh.

The HDPR (Hurdler Dual Ported RAM Interface) is intended for VME, STD Multibus or other remote chassis with a dedicated CPU and allows simple high-speed communication between a

should contribute more,

t less, and be less time conning, the ComDesign Group

N.E.T." has some great news

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our SPX/ENA family and see ow it handles Simply call our hothine and

ork you could build with

ations, speeds, protocols or local and remote sites into a single, efficient network. The SPX

tire network. We designed the SPX especially to accommodate different Macintosh II and an external system. The HDPR is available for \$299. The H2CS (Hurdler Two Channel Se-

al Board) reportedly uses the same in-erface chips found on the motherboard of the Macintosh II and includes a con ble driver in read-only memory (ROM). An on-board Motorola, Inc. 68008 microcessor supports rates as fast as 1M sec. The H2CS costs \$249.

bil/sec. The HZLS costs \$249.

The HPBs is an interface-to-Opto-22

PB8 eight-channel I/O panel that provides digital control and sensing of eight Ac/DC signals. It includes a Mac II interface board and all required cabling for connection to the Opto-22 board. The HPBs

The HMbus is a Nubus-to-Metrabus terface board that includes digital and salog opto-isolated relay racks and mul-channel analog I/O. The HMbus costs

The vendor will also provide exist Hurdler clients with the ROM Devel rharder chemia with the ROM Develop-ment System, a set of software tools that reportedly provide MPW source code and script examples of drivers writ-ten by Creative Solutions that may be used as templates for ROM creation. The software costs \$149.

Creative Solutions, Suite 12, 4701 Randolph Road, Rockville, Md. 20852. 301-984-0262.

AST Research, Inc. has released an enhanced software product for the Advantage /2-386 memory board with optional I/O capabilities for the IBM Personal I/O capabilities for the IBM Personal System/2 Model 80 computer.

The company has added the Asterma expanded memory manager to the Advantage /2-386 package to provide support for expanded memory. The software references with the companied memory. The software references are supported memory. ortedly permits a user to utilize linear emory as expanded memory when running application programs, such as Lotus Development Corp.'s 1-2-3 Release 2.0 and 2.01, or operating environments like Microsoft Corp.'s Windows 2.0. The sys-Microsoft Corp.'s Windows 2.0. The sys-tem provides up to 8M bytes of 32-bitwide memory on a single card. Two op-tional I/O modules are available - one

with two serial ports and one with one se-rial and one parallel port.

The Advantage/2-386 with Astemm software costs \$1,095 with 1M byte of memory and \$7,335 for a 4M-byte-m ory version. The I/O modules cost \$345

AST Research, 2121 Alton Ave., Ir-vine, Calif., 92714.714-863-1333.

STB Systems, Inc. has announced two board-level products for the IBM Person-al System/2 Models 50, 60, 80 and com-

The Serial 2 is a fully programmable asynchronous serial adapter with two RS-232C serial communications ports and is compatible with the IBM Dual Async Adapter/A, the vendor said. The board provides a programmable bit/sec. rate generator which allows operation from 50 to 19.2K bit/sec. and supports 5-, 6-, 7- or 8-bit characters and 1-, 1.5- or 2-stop bits. The Serial 2 is available for \$239.

The Serial / Parallel 2 was design to function as a basic two-port I/O adapter and incorporates one RS-232CD asym chronous serial port and an industry-stan-dard parallel port. It also includes a programmable bit/sec. rate to 19.2K bit/sec. The Serial/Parallel 2 costs \$259. STB Systems, Suite 210, 1651 N.

Glenville, Richardson, Texas 75081.

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Data storage

Emerald Systems Corp. has introduced two half-height cartridge tape drives, avail-able in 60M- and 150M-byte ca-

According to the yendor, the drives can be configured to run on local-area networks, DOS and mix systems. The units incorporate all of Emerald's proprietary tape features, including ASP software in DOS and LAN configurations for ease-of-use and unattended backup. Running under Xenix, the drives use all standard Xenix utilities, accord-

g to the vendor. The 60M-byte internal drive sts \$1,295; the 150M-byte internal drive is available for

\$2,095. Emerald Systems, 4757 Mo-rena Blvd., San Diego, Calif. 92117.619-270-1994.

A 150M-byte internal 31/1-in. tape backup system designed for IBM's Personal System/2 series is now available from Maynard Electronics Co. Maynetream 150 report-edly enables pages 4 to 150.

edly enables users to transfer an entire cassette of data in 24 mins and runs across all models of e PS/2 series, including the del 50 and all three versions

of the Model 70. Features include an electronic automatic tane tension control, direct drive tage motors and read-after write capabilities. The product uses a standard

D/CAS-85 format and works with most local-area networks, the vendor said. Maynstream 150 is priced

from \$1,600 to \$2,000. Maynard, 460 E, Semoran Blvd., Casselberry, Fla. 32707. 407-331-6402

A tape subsystem for data archiving in an 8mm format is now available from Brainwave Sys-

ems Corp. Dubbed Data Historian, the oduct reportedly offers 2G sytes of storage capacity and is offered on a variety of platforms including the IBM Personal Computer, PC XT, AT, Personal System/2 and compatible sys-

Security, fault tolerance, data verification and key menu func-tions are included. An optional programmer's library and the Universal File Format for data

record and file management are Data Historian carries a price of \$5,995. Brainwave, Suite 3, 3400 Industrial Lane, Broomfield, Colo. 80020. 303-466

FlexStar

Flexstur's solid-state Winchester simulator

Flexstar Corp. has announced the FS501 Winchester Simulator, a solid-state unit that characterizes controller perfor-mance and calibrates disk-drive test equipment for correlation of disk-drive performance.

According to the vendor, the unit is self-calibrating and devoid of mechanical or temperature-

It electronically simulates disk-drive read/write functions as well as frequently encoun-tered mechanical, electronic, en-

vironmental or media-related The product ensures full po rameter systems testing and

ster and come The unit has a reported aver-

age access time of 28 msec and a reported data transfer rate of 5M bit/sec. A version is also available for interface to Sun Microsystems, Inc.'s Sun-3 work-stations running under SunOS, the vendor said.

The APX-4000 is available in either external- or internal-mount configurations and is priced from \$4,250 to \$4,450. Maximum Storage, 5025 Centennial Blvd., Colorado Springs, Colo. 80919. 719-531-

Storage Dimensions, Inc. has unveiled two personal com-puter hard-disk subsystems tha allow 651M bytes of data stor age on a single hard drive.

analysis of all 3½- and 5¼-in. Winchester disk drives with in-dustry-standard enhanced small device interfaces. speciator AT650E and the Lanster LAN650E, each mount in a standard peripheral The two internal models, the The FS501 costs \$2,995. Flexstar, 606 Valley Way lipitas, Calif. 95035. 408-946 mount in a standard perspersis bay in the host computer and provide full support for both Mi-crosoft Corp. MS-DOS applica-tions and Novell, Inc. Netware servers. Both are supplied with the necessary enhanced small device interface controller and A high-speed 5¼-in, write-once read-many optical disk subsys-tem is now available from Maxi-mum Storage, Inc.
Designated the APX-4000, the 500M-byte subsystem was designed for the IBM Personal

menu-driven utility software.

The AT650E costs \$7,395, and the LAN650E is priced at \$7,495.

Storage Dimensions, 2145 Hamilton Ave., San Jose, Calif. 95125.408-879-0300.





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coaxial access to mainframe data from your PC or PS/2 via 3270 emulation. RabbitSTATION Remote provides remote mainframe access for PCs without using costly IBM controllers All use less PC memory and provide file transfers up to 50% faster than the competition. LAN gateway solutions: RabbitGATE II gate-

ways enable your NETBIOS and Novell IPX LAN workstations to simultaneously share mainframe resources using multiple protocols and options at transfer rates up to 64 Kbs including SNA, BSC, DFT, and X.25.

Existing 3270 device solutions:

RabbitCLUSTER gives your PCs the capa-

Peripherals

A 14-in, color monitor that re-portedly offers compatibility with the IBM Personal Comput-er, PC XT, AT and Personal System/2, as well as the Apple Com-nuter. Inc. Macintosh II. has en announced by Hyosung

emputer.
In addition to these systems, the Maxiscan Color Monite reportedly will support AT&T's 6300 machines, Olivetti & Co. Olivetti M24 and 28 models and

According to the vendor, the monitor has an 820- by 620-pixel maximum resolution, and text processing is available in green, er, cyan and white on blue. An infinite color palette is avail-

able in analog mode. The product costs \$679. Hyosung Computer, Suite 285, 710 Lakeway, Sunnyvale, Calif. 94086, 408-733-0810.

Several terminal emulation products for Digital Equipment Corp. and Data General Corp.

available from KEA Systems The ZstemPC-D400 re-portedly emulates the DG D400, D200 and D100 ter

ents are now

runs on the IBM Personal Comter, PC XT, AT, Personal System/2 and compatibles.

The product offers support for both normal and compressed

character spacing, and three file-transfer options are available: ASCII, Kermit and Xmodem. A minimum configuration re-ires 256K bytes, a serial port

quires 256K bytes, a serial port or internal modem, an IBM Col-or Graphics Adapter, Video Graphics Array or Enhanced Graphics Adapter and one floppy drive with Microsoft Corp. MS-DOS 2.0 or higher. ZstemPC costs \$160.

The vendor has also reconfigured the Zstem 240 and Powerstation 240 product line to include Digital Equipment Corp. VT340 emulation capabili-

version 2 will feature an 800-by 480-pixel display and Kermit server-mode support. According to the vendor, both units allow IBM PCs, XTs, ATs, PS/2s and s to com with DEC PDP-11 and VAX sys

Zstem 240 emulation soft-Zstem 240 emulation soft-ware costs \$295; the Powersta-tion 240 package with a standard keyboard is \$435. KEA Systems, Suite 412, 2150 W. Broadway, Vancouver,

B.C., Canada. V6K 4L9. 800-663-8702



dustrial Computer's Multisynch-RM A rack-mount kit designed for the NEC Corp. Multisync-II monitor is now available from The Multisynch-RM costs

The Multisynch-RM re-The Multisynch-RM re-quires 1½... of rack space and is 16 in, deep with the monitor in-stalled. The product was devel-oped to provide users with an easy method of installing the NEC monitor in a 19-in. rack. No modifications are necessary for

ISO. Industrial Computer Sou Suite 208, 5466 Complex St., San Diego, Calif. 92123. 619-279,0084

Ampex Computer Corp. has announced upgrades for its Am-pex 232 VDT. Enhancements include Digital Equipment Corp. VT100- and ANSI-emulation capubilities, a parallel printer port and a revised personal comp

The Ampex 232, designed for the PC multiuser marketplace, is still available in the original AS-CII format. The unit is offered the VT100 emulation, parwith the VT100 emulation, par-allel port and IBM Personal Computer AT keyboard at no additional cost to the regular retail price of \$554. An enhanced RT keyboard is available for an additional \$5.

Ampex, Computer Products Division, 401 Broadway, Red-wood City, Calif., 94063. 415-

Ehman Engineering, Inc. be-gan shipping its 105-key ADB Extended Keyboard. The product was designed for users of Apple Computer, Inc.'s Mac-intosh II, Macintosh SE and Apple IIGS systems.

ple IIGS systems.
According to the vecdor, a keyboard macro software package — Quickeys from CE Software Ca. in West Des Moisses, Iowa — is bundled with the keyboard to allow users to customize the product.
Features include 15 function keys, six page-control keys and n18-key susers foxed.

an 18-key numeric keypad. The ADB Extended Key board costs \$199 and carries a full one-year warranty.

Ehman Engineering, 97 S. Red Willow Road, Evanston, Wyo. 82931. 307-789-3830.

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bilities of an IBM 3274 controller plus ASCII device connectivity in one device. At a fraction of the cost. And without impacting your host PC's performance.
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Landmark Systems Corporation ers Creacest Drive, Vienna, Virginia 22380-2700

NETWORKING

DATA STREAM

NTT speakers see '90s implementations, but not without practical use Patricia Keefe

Why fear Novell?



levue, Wash.'s very put-out billionaire crushed last th's would-be strategic allice between Ashton-Tate and icrosoft rival Novell.

An angry Bill Gates report-dly bludgeoned good buddy ton-Tate with threats of a ome proprietary code vital to a oint SQL server project. You night say the alliance really got Bill's temper rocking, which is not surprising, since Gates is sed to wrest control of the LAN market away from No

onsisting of Ashton-Tate, Syhase and Microsoft is building an SQL data base server. Sybase is supplying the engine, Micro-soft is adapting the technology to OS/2, and Ashton-Tate is supplying Microsoft with some techlogy as well as building a

front end using Dbase IV.

The strange thing about all this is that Microsoft may have cut off its nose to spite its face. The company is naturally co-cerned about Novell's SQL Server. The deal with Ashto Tate would have resulted in Novell's support and distribution of the Sybase Server, redirecting its own SQL efforts into some sort of administrative management a

Continued on page 69 modem control

ISDN waiting on applications

BY LORI VALIGRA

TOKYO — Integrated Services Digital Networks (ISDN) hold nty of promise as the next eration of communications. generation of communications but fancy technology will go no where without strong applications, according to players in ma-jor ISDN markets speaking at the Nippon Telegraph & Tele-phone (NTT) International Symum 88 held here Oct. 3-4.

"We have to develop uses ong with] the technologies, said Kazuhiko Gotoh, senior vice-president of NTT Telecomries. In April, NTT Isunched a nationwide ISDN network in three metropolitan areas; the

network has spread to 26 cities. Reith E. Ward, chief engines at British Telecom PLC, agreed He said that the European com munity's integration in 1992 could be a key date for proliferation of ISDN networks, becau members want their networks to

Other key elements
"But compatibility of ISDN ter-minals and networks does not necessarily mean the service will take off and grow," Ward said. "It's like having a personal com-puter on your desk without a spreadsheet or word processing program. It's the applications

that will make it work."

British Telecom's initial 80K bit/sec, ISDN was introduced in

IBM, DEC support questioned

BY PATRICIA KEEFE

NEW YORK - In the past three hs, users have been pleas antly surprised by the one-two

antly surprised by the one-two punch of multivendor service of-ferings by IBM and Digital Equipment Corp. But the real surprise may lie in whether both vendors — long

resistant to supporting nonpro-prietary equipment — can actu-ally pull off this promised turn-Analysts said these proclams

 Synoptics rolls out two hosts. Page 70. tions of open-arms support for Continued on base 65 vendor for more than 75% of the According to Kathryn Koros toff, an IDC analyst who wrote respondents. In comparison, only 50% of the respondents

rds were set. In early 1989.

the company plans to upgrade that offering to a 144K bit/sec.

Basic Rate Interface and 2M bit/sec. Primary Rate Interface service conforming to CCITT

Another key to making the Continued on page 69

Tops jumps into E-mail market with Inbox purchase

Satellite link putting stars in NASA, NSF eyes.

Page 62.

Page 63

Centralized net management tops corporate concerns

BY ELISABETH HORWITT

Centralized network management is important; multivendor less important; and voice/data hardly important at all, accord-ing to Fortune 1,000 data com-munications and MIS managera interviewed earlier this year by ternational Data Corp. (IDC), a market research firm based in Framingham, Mass.

More than 25% of the respon dents said they intend to go with an internally developed network management system. Roll-yourcom network management systems have been the norm for many years, the report said, because until 1987 most netw

About 20% of the respon-dents said their strategic direc-tion was toward a multivendor network management system. Approximately 8% of the reets said their networks

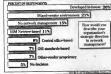
would be managed from a carri-er's central office-based system. Only about 7% said their sys-tems would be based on the OSI standard (see chart) About 50% of the resp ents said they currently use between one and three network

ement systems, while a little more than 30% use between four and six systems. About 2% use more than six systems, and about 10% have no Network management was an "important" to "critical" crite-rion for choosing a networking

cited multivendor network management as a critical or impor tant issue, and 71% said that in tegrated voice/data network management was not important

the report, one reason for the lack of voice/data integration is the fact that voice and data are still managed by separate orga-nuzations in many Fortune 1,000

Strategic directions in network management Based on a survey of 100 MIS and data communications managers



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For an educational institution, nothing is more important than the smooth exchange of information. That's why many colleges are

making information networking a top priority.

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Colleges and universities, like most places, acquire computers and telecommunications hardware in patchwork fashion, ending up with

little or no compatibility.
For one northeast college, AT&T Network
Systems, working with the local telephone
company, demonstrated that ISDN was the
solution. Their information services manager

company, demonstrated that ISDN was the solution. Their information services manager explained: "ISDN gare us the best capabilities for the least cost. And we didn't have to trash our existing systems."

With central office-based ISDN, ordinary phone lines become the links in a fully lineserative persupt. This translates into many.

phone lines decoune the links in a fully interactive network. This translates into many applications and benefits. Volce and data on terms into distinguishment of the translated simultaneously for example, students and professors can confer with the Den, who has on thin access to student records. Electronic mail streamlines interval communication, so course enrollment changes can be posted immediately and Portential lacessor to course enrollment changes can be posted immediately and Portential lacessor for some developers access to sphisticated software and multiple databases.

As the college's IS manager puts it: "ISDN can revolutionize the education experience. It's going to make us a better college. And, bottom line, a more competitive college."

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Tops seeks edge in E-mail arena

Hopes PC-to-Mac package will become LAN messaging standard

BY PATRICIA KEEFE

ALAMEDA, Calif. - In an effort to get a jump on the emerging electronic mail market for localarea networks, Tops has purarea file worse, tops less year chased the Inbox personal com-puter-to-Apple Computer, Inc. Macintosh mail package from Symantec Corp. for an undis-

ng inbox technology with its LAN operating system. Tops is hoping to catapult into the driver's seat as the E-mail standard. Mail is the feature ost requested by Tops users.

Tops, a division of Sun Micro-systems, Inc., makes Tops softident and general manager of are, which supports and links agether three distinct environ-ents: AT&T's Unix, Microsoft Corp.'s MS-DOS and Apple's op-erating system. Plans have been mounced to support SunOS ad Digital Equipment Corp.'s

The strategy here is to cre entum in the user

standard for LANs in general, as well as between Macintoshes and the rest of the world. To ward that end, Tops has unveiled a three-pronged strategy. First, it will create

narket share" by seeding 400,000 Tops users with Inbox which they will receive along with the next upgrade of Tops software sometime in the third

cusarter of 1989. With a shipping rate of 35,000 to 50,000 nodes a month, Tops should be able to users before the end of 1989, claimed Rick Shapero, vice-pres-

Second, the Inbox development team will come up with a new version featuring PC server support - important since Tops is increasingly becoming a PC-only network. Also, Tops will provide a developer'a kit to enable third parties to write gate-

ways for, and integrate applica-tions into, Inbox.

Third, Tops and Inbox will become tightly integrated on a sys-

on Inbox as the messaging tems level. "We want you to be able to install Tops and automati cally get mail," Shapero said.
"The crucial difference is to

give equal functionality on all platforms," Tops product manager Helen Berry said. Although Tops claims Inbox has twice the installed base of Microsoft Mail, that claim was

disputed by some analysts, wh suggested the reverse is true. In any case, Tope' entry into the Macintosh E-mail market is expected to heat up competition among a handful of competitors: Microsoft's Mail, CE Software

Co.'s Quickmail and 3Com Corp.'s 3+Mail. ree market keys There are three keys to this market, according to analysts: PC support, application integra-tion and gateways to other envi-

CCITT's X.400 Users need both gateways and the ability to send docu-ments from within their applica-tions, said Dave Kosiur, editor of Connections," a Fullerton,

networking, "Corporate users won't bother with any Mac-based E-mail packages that can't communicate with larger ma-chines," he added, suggesting

Tops may have a leg up h with the Strong relations third-party community - on which Tops, CE Software and Microsoft have said they will rely

Most of the vendo

"A lot of people are expecting a Microsoft-Sun war, and that's nousible. Microsoft has considered messaging something to be very aggressive with, and we'd expect them to be very competi-

DAVE KOSIUR

"Shapero said. However, he suggested Mi crosoft would have a hard time matching Tops' installed base. Noting that Microsoft is also an for a variety of gateways - are dications developer,

ORPORATE USERS won't bother with any Mac-based E-mail packages that can't communicate with larger machines."

"CONNECTIONS" Tops said it will provide a Unix mail gateway itself but is talking with Softswitch, Inc. about providing an X.400 gateclaimed it has tended to keep its Mail application programming interfaces under wraps. But Microsoft has a few cards

yet up its sleeve. Tops has its hands full at the moment, and Microsoft has promised to build hooks for Mail into its word pro-Most of the vendors provide deepers to be going a step further by tempting developer interest with hard numbers — that is, Tops' sizable installed base. Shapero cited a recent Inforucia, inc. study that positioned Tops a mere 194 in market share being 3Com in total LAN shipments. hooks for Mass into its wort pro-cessing and spreadsheet applica-tions. Given the installed base of those applications, such support-just might give Microsoft Mail the turbocharge needed to over-take the rest of the LAN E-mail

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them with user manuals and passwords and make consolidat-ed payments. SIMBAD is an ac-

database maintained by the atre de Donnes de Stras-

mostly interested in developing

protocols to translate perween U.S. and European versions of the ISO Open Systems Intercon-

tocols to translate between

graphy for Astronos database

work is to assist its com k is to assist its community of earchers, while the NSF is

Satellite net fine-tunes database reception

BY MITCH BETTS

WASHINGTON, D.C. - The National Aeronautics and Space istration and the National ed up to create what is, lit-, an astronomical network In a precedent-setting col-

laboration, NASA and the NSF recently established a satellite network link that will make it ch easier for U.S. scientists to gain on-line access to the world's foremost database on astrono-

foremost database on astrono-my, located in France.

The database, known as SIM-BAD and residing at a data cen-ter south of Paris, enables an as-tronomer to look up detailed information about stars, planets and supernovas. NASA officials said the database, dating back to 1950, lists nearly all known information and techni-about celestial objects.

International barriers
The problem is that U.S. astronomers have been hampered in their access to the database in the past. For one thing, NASA said, the standards of interconnection for French computer systems are different from those for U.S. systems and not all uni-versities or research labs were the remainder of the circuit able to connect easily.

Secondly, the dial-up connec Circuit cooperation
The circuits are being installed
by MCI Communications Corp.
the French national public
telephone and telecommunications authority, Goldstein said. tion to France was costing nearly \$100 per connect, which is be-yond the reach of all but a few as-

ers, NASA said. tronomers, NASA said.
To solve these difficulties,
NASA and the NSF acquired a
satellite link between Princeton
University and the Institut National de Recherche en Informatione et en Automatic (INSPI).

tique et en Automatique (INRIA) INRIA has developed a gateway that translates between the Transmission Control Protocol/ Internet Protocol used by U.S.

research institutions and the CCITT protocols used by the French Transpack data service, according to Steven N. Golded payments. Carness.

ronym for the Set of Identifications, Measurements and Biblifor Astronomical Data, stein, lead engineer at NASA's contractor, Mitre Corp. in McLean, Va. INRIA is also providing a link between the satellite circuit and the Paris data center where the database resides, Goldstein ex-

Under the cooperative effort, the NSF has paid about three-fourths of the costs of a perma-

nent network hookup, and NASA is underwriting the

Excelan

enhances VMS line

BY PATRICIA KEEFE

SAN JOSE, Calif. - As was ex-pected, Excelan, Inc. recently The network is expected to be operational later this month, operational later this month, once a few minor glitches are ironed out, he said.

The Cambridge, Mass.-based Smithsonian Astrophysical Observatory—acting as NASA's agent for SIMBAD—will register U.S. astronomers, provide unveiled a key expansion of its Digital Equipment Corp. VMS product line: support for Sun Microsystems, Inc.'s Network File System (NFS). The NFS product reportedly

features file/record locking to al-low Microsoft Corp. MS-DOS, AT&T Unix and VMS users atmultaneous access to a file.
"DOS and Unix users shouldn't be asked to run a tras

lation program just to access a text file under VMS," said Bob Davis, an Excelan product line manager. The NFS protoco provide users with access to al-most limitless file space, he said. In addition, Excelan extended its Local-Area Network Service for VMS to support DEC VMS 5.0 and said it had licensed start-up TGV, Inc.'s Multimet, a host-based Transmission Control

Protocol/Internet Protocol im-plementation for the DEC VAX/ VMS environment. Excelan's NFS support in-

cludes a distributed file system management utility said to sim through interactive on-screen ulation of NFS parameters. This utility allows network ministrators to add new users just by filling in the proper information on the screen, Davis said

File format translation and file name, mapping are done by the NFS server, which frees the user for higher level tasks. LAN Service NFS is available as an addition to LAN Service for MS; prices start at less the

Release 3.5 of LAN Service for VMS supports VMS 5.0 and will be distributed free to all custy or service contract.

Multinet reportedly supports all VAX/VMS pistforms, with complete VMS conversion com-patibility from 4.4 to 5.0. It provides the standard suite of applications (Telnet, FTP an cations (Tether, FTP and SMTP) and supports third-party programming through either a Queue I/O interface or its Berke-ley 4.3 BSD socket interface. Multinet prices range from \$1,995 to \$17,950, depending

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Comten courts compatibility

Communications controller rollouts bring NCR subsidiary closer to IBM

BY ELISABETH HORWITT

ST. PAUL, Minn. - Product in actions in the past two is have enabled NCR Com-Inc. to boost its viability as a for of IBM-compatible com-

ie a long-awai cruze a tong-awarded Token-ing connection and multiven-re quick-switching capability, tch up to IBM in some impor-nt areas while also providing the added value, the NCR up, subsidiary claimed.

tions Function/Network Co Program (ACF/NCP), w

cessors for the materianes.

The new version is compatible with IBM's ACF/NCP Version 4 Release 1 and Release 2; it provides some of the same functions, including Token-Ring and Netview support, Comten said.

is a third-party SNA vendor, conten has had an increasingly lifficult time finding niches that time finding niches that has not yet covered and iding added value while taining IBM compatibility, dring to David Passmore, a just at Fairfey V. firm Network Strategies

They do well with co who are looking for competitive pricing, since you get more bang for the back with Comten hardware," Passmore said. hardware," Passmore said. These latest announcements should help Comten hold its pre-sent market share, without prong any significant gain, be

"Comten will continue to pro-vide IBM-compatible NCPs; we're still in the SNA business said and intend to stay there, Comten spokesman Linvel Karres. Comten plans to bring out its version of IBM's NCP Version 5 sometime late in 1989 and also plans support for IBM's recently announced capability of ng up to 65,000 subareas in the same SNA netwo

Compared with IBM The Token-Ring interface in-

volves a direct connection to a Comten 369X, which can support up to 10 local-area network attachments, or a 5600 communications controller, which can support up to 20 LAN attachments, Comten said. In com son, IBM communications con-trollers have an eight-LAN limit, according to Karres. Comten's Token-Ring interface can also

Networking System, communi-

send Token-Ring traffic statis-tics and alerts to Netview. Last week, Comten an-nounced the Multi-Versior The software supports SNA, The software supports SNA, bisynchronous and remote lines. While IBM provides a similar ca-

the fact that Comten's software resides on the front-end procesrides advantages such as ing host overhead, Pass-Also, implementing the soft-ware on the network instead of the host makes it possible to con-nect terminals to multiple, multi-

vendor hosts over X.25 and di rect connections, said Comter

lity in VTAM on the host,

les on a Comter Pacility res 369X or 5600 cor processor. Scheduled to be avai able in the second quarter 1989, it has an annual license

ranging between \$2,640 a \$7,920, depending on the co as processor, plus a \$1,045 anni

THERE ARE FEW THINGS PRO-IX



Even IBM, DEC, and UNIX* applications are compatible when developed with PRO-IV, the professional development language from McDonnell Douglas. That's because applications developed with PRO-IV are hardware, operating system, and data base independentoffering virtually unlimited portability.

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IBM. DEC

FROM PAGE 59

third-party equipment will de end heavily on whether the companies achieve two goals: execute agreements with capable third-party service providers and convince other systems vendors, including each other, to sit up and take notice when told,

ermined that it's when multive

networks falter, users are often caught in a vicious cycle of fin-ger-pointing among vendors. It is not clear how these service programs will avoid more of the same, although IBM and DEC insist they will.

One key problem, at least among the large systems ven

dors, is that none will so easily hand over control of a customer network, said analyst Jeff Kaplan, market researcher at Lex-ington, Mass.-based The Ledge-

way Group. Loss of control could mean loss of sales, Kaplan com-

calation of the battle for control over the customer network," he said. "Vendors are hoping to

build a close, comprehensive re-lationship with customers be-yond the single-product solu-tion." Service support is seen as the glue that will bind customers to vendors, be said.

Moreover, end-user focus roups moderated by Ledgeway ave revealed very little faith in

vendor support services. Most oup participants reported that adors do not understand user

needs, do not understand er about their own equipment and refuse to address third-party equipment, Kaplan said.

The kicker is that large cor porations are generally unwilling quish control of any strategic system to an outside orga nization. The real target audi

tege upsum to an outside orga-tion of the control of the control

Options
An optional enhancement involves installation of monitoring and diagnostic probes on certain segments — typically critical network circuits — for problem detection and inolation and personal problems of the problem

detection and isolation and per-formance monitoring. Support of T1 systems is available. Kaplan suggested the diag-nostic probes are a repackaging of Pacific Spectram's product and basically monitor only the wide-area portion and end nodes of the network. "The difficulty in the network. "The difficulty lies in getting to the LAN area: I think there a more fruff than sub-stance here," he said.

IBM said it will isolate any problem calls to the responsible vendor, notify it of failing network equipment or communica-tions facilities and coordinate its

resolution efforts.

Affected third parties will co-operate with IBM because "all vendors try to provide the best ervice to the customer. said Vice-President lames

Meintenance alliances Also, under an optional Service Management plan, IBM said it will form alliances with maintenance vendors to provide hardware maintenance for the customer's prescribed coverage on selected non-IBM products. IBM will negotiate the terms and handle administration and vendor-invoice payments under the contract. Within the defined network,

data networks must have a des-ignated IBM CPU, and voice netorks must have an IBM/Rolm **Business Communications Sys**tem. The required equipment must be under IBM warranty or ne contract

DEC's ISS program is also targeted at multivendor net-works and is reportedly focused on planning, design, implementation and ongoing network

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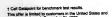
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N.Y. links up with Nynex group

BY ELISABETH HORWITT

ALBANY, N.Y. - The New York State Office of General Services has chosen its regional Bell holding company to put together and manage a \$180 milon voice and data network that will connect some 100 state

agencies New York state recently awarded the contract for a statewide network to a consortium of bidders that includes Nynex Corp., IBM and Eastern Micro-

e, Inc. Empirenet will be a digital network that will support both voice and data transmissions ong some 100 state agencies. as well as the New York State Lottery, according to state okesman Tom Tubbs. Besides providing more effi

cient data interchange, the pri-vate network should save New York about \$15 million annually in operating costs — specifically "in telephone bills [we] won't have to pay any longer," Tubbs

While the cost savings are clearly a plus, the primary moti-vation behind the network was the fact that New York Telephone Co. is about to disconting roup Channel Services, an analog equivalent of T1 netwo

at forms the basis for the state's current system, accord-ing to Bob Reinhold, senior proj-ect manager at Network Strategies, Inc. Network Strategies ovided technical consulting during the contract request-for

supply New York's intraregion voice and data connections at rates of up to 56K bit/sec. User equipment will access the lines via on-premise voice and data multiplexers, which will interface with Network Equipment

Technologies, Inc. (NET) T1 switches located at the Bell operating company's central offices. Nynex is supplying the multi-plexers, while IBM is supplying the NET writches.

Traffic speeds While most state traffic will be at rates of 9.6K bit/sec. or lower. 56K bit/sec, lines will be used to connect state lottery retail outlets with the lottery's computers, according to Jesse Rosen,

executive director at Nynex In-Solutions Fastern Microwave will handle

Nynex will act as systems in tegrator of the project. The com pany will also design, impl and operate the network control center that will provide network monitoring, diagnostics, trouble reporting and billing for Empirenet 24 hours a day, according to Gad J. Selig, a vice-president at

The carrier plans to use a combination of its own software and IRM's Netview to perform onitoring and collect network data from the networking equip-

ent, Sehg added. The Nynex group won the bid gainst AT&T, Rochester Telephone Corp. and a combined efort from MCI Communications Corp. and Racal-Milgo. New York chose the Nynex contin-

gent because "it can provide the training, maintenance, installa-tion and technology which is required, at the lowest cost," Tubbs said.

One attractive feature of the group's proposal, Tubbs noted, is that the state will not have to take any initial capital outlay Equipment will be paid for over five years out of the operating costs of state agencies that use the network. Agencies will pay Empiremet "out of the money they save in phone bills," and Empiremet will then pay ven-dors. Tubbs said.

The one area Empirenet will ot serve will be the capital district, which is already connected by Capnet, Implemented about two years ago, Capnet provides oice and data communication for all state offices in the capital district, Tubbs said. Users of the two networks will, of course, be able to communicate.

Communications, Inc.'s Link Node and Concentrator Node

AN-to-WAN Communications

le with AT&T's cunet T1.5 and Customer Con

Servers has been certified as

Using custom chip development

and surface-mount manufactur-ing, Ideassociates, Inc. said it

of its IBM 5251 card next month

that has only four chips. When originally introduced in 1985, it

to offer the same PC-to-IBM mid-range communications ca

publisty. The custom chips will

also increase circuit perfor-

nace by neveral orders of magnitude, according to the Bill ca, Mass.-based company.

took more than 90 compo

ice a half-card version

Borland joins growing CAS interface fan club nunications companies this fall

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portand International, Inc. the Communicating Applica-tions Specification (CAS) in-terface developed by Intel Corp. and Digital Communications Associates. Inc. Borland said it is implementing support for both CAS and Intel's new Connection Coprocessor board across sever-al of its applications. Sidekick Plus will reportedly provide CAS monnert in 1989

Along with the foliage, executive faces are changing at two comRetix Corp., a supplier of Open Systems Interconnect software, recently appointed Frankel president. He replaces Andy De Mari, who is now chairman and chief executive offi mes Lakin, formerly president of Contel Business N Inc., has jumped over to Glo-benet, an interexchange carrier, where he serves as president

Industry Association named Patrick H. Williams director of

government relations. He will dinate efforts to lobby federal officials and agencies.

Having trouble keeping up with the new product avalanche? Interconnect Data Systems, Inc. in Ansheim, Calif., has unveiled a database of installation ides, product compatibility in ermation and error-m explanations, as well as inform tion on hundreds of personal computer networking products from a wide array of vendors. Users get monthly updates of the floppy disk-based Technical Encyclopedia of Computer Hard-ware and Software, which can be

dvanced Computer Com-nunications, Inc. has un-siled the ACS 9315, a higheed hardware interface said to work with appropriate software on IBM MVS and VM hosts to link those mainframes with Ethernet local-area networks. It supports the IBM-defined Con-tinuously Executing Transfer In-terface protocol, which minises the number of me art I/O operations and I/O interrupts required to exchange data, resulting in greater IBM-to-Ethernet throughput. The ACS 9315 costs \$19,000.

Digital Com munications Associates, Inc. recently en-hanced its DCA HLLAPI3 to poort the vendor's entire line of PC communications prod HLAPPI3 is a software specification used to develop cus communications programs. It supports Distributed Function Terminal and Control Unit Ter-

Tiara Computer Systems, Inc., a supplier of LAN cards and related software, said it is offering users a lifetime warranty for network cards - reportedly

warranty includes parts and service for Tigra's Lancard products for both Arcnet and Ether net technologies. Tiara also said it is the first company to incorpo-rate Fujitau Microelectronics, Inc.'s advanced Etherstar LAN controller chip in network cards. The chip serves as the foundation for Tiara's new line of high-speed Ethernet cards.

Maxcom USA announced that its global telecommunications service, Maxlink, is now accessible to users of IBM's Pro al Office System, Digital Eq ment Corp.'s All-In-1 and W aboratories, Inc.'s Mailway via bridge software from Softs-witch, Inc.

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We make it better, or we just don't make it

Keefe

CONTINUED FROM PAGE 59

erver. But nooco. Instead, we can look for Novell to support SQL Server anyway while wor ing out a similar deal with SQL vendor Oracle. As for the embarrassed Ashton Tate, an insider confirmed it will likely ok up with Novell compet

inager co-developer 3Com.

"Look, Microsoft is very much afraid of Novell," a source close to all three ven-dors claimed. That's obvious, but I'm still not sure why. While Microsoft wants to be a key player in the LAN arena, its OS/2 efforts are targeted at the OEM market. Novell encourages developers to support its network, but the company's

products are sold to end users. Novell gets Microsoft's gost for be-ing its usual prickly self. Dogged, perhap by a "not invented here" complex, Noveil tends to be obsessed by perform ers to avoid licensing fees. To this end. Novell's Netware is based on a proprietary protocol stack and provides support for other protocols and standa

Getting the big boys to play Of course, it's tough to set a standard if you can't get the leading player(s) in the market to play ball. But Novell doesn't hold all the cards here. It may have a grip on an estimated 50% of the departmen tal market, but that could mean nothing tomorrow. The fact is, the LAN market has barely been scratched — perhaps

only as much as 5% of its potential.

Moreover, IBM and the rest of the in

dustry will play a bigger role in determin-ing the outcome of Gates' plans to redi-rect the course of desktop connectivity. If Microsoft can continue to pull in support from major developers and large system vendors, then both IBM and Novell will have to support LAN Manager. Actions speak louder than words — even if they

per load, angry words.

But if Gates is really trying to set a standard, then why try to limit SQL Server to LAN Manager systems? The assumption here is that Sybase Server will

become the premier SQL database, forc-ing users to move to LAN Manager. What if it doesn't?

The connectivity arena is replete with standards. But this is because no o magic formula that will do it all for all networks. A few key standards will emerge, and LAN Manager may well be ne of them. But don't he too surprised if OS/2 networking ends up looking a bit like MS-DOS networking: three different solutions from three major camps --IBM. Novell and Microsoft/3Com.

It's a little early to tell who, if anyone will be king of this networking hill. We're still waiting on IBM to ship LAN Server (next month) and spell out its LAN Man-ager strategy (hopefully next month). re still waiting for robust OS/2 con tivity solutions from 3Com and No vell, both of which will ship OS/2 support in phases. Also playing a key role are IBM's Database and Communications Managers and third-party alternatives.
Until this stuff ships and users make their choice, it's anyone's ball game.

Keele is a Computerworld sesion editor.

ISDN waiting

CONTINUED FROM PAGE 59 vitch from today's analog networks to digital ISDN is the development of cost-effective adapters for terminals to use with the installed equipment base, ac-cording to Joseph Timko, an AT&T vice-

The lack of those boards has created a

SDN MUST MAKE available everything the customer has now, and do so at a cheap price.'

> GARY I. HANDLER RELLCORE

major barrier. Although m yers now follow the CCITT standard delines for ISDN, a manager with a major U.S. semiconductor company said his firm has counted 100 versions of CCITT ISDN worldwide, 20 of which are in the U.S. They exist because of huge loopholes in the ISDN definition, he

These 100 versions spell had news for customers and chip makers. While cus-tomers fret over which version to buy, chip makers fear they will have to accom-modate multiple ISDN versions in their interface circuits.

According to the manager, part of the

reason that Japan is two years ahead of other nations in getting ISDN to custom-ers is that it has one standard fostered by NTT, a dominant market force here. By contrast, the seven regional Bel holding companies have been running in-compatible ISDN trials. "Most trials are

compatible ISDN trials. "Most criass are not compatible systems, so they are not interconnectable," claimed Gary J. Han-dier, a vice-president at Belliore, the re-search and development group owned equally by the seven regionals. "Custom-ers don't like this. We are publishing a series of technical manuals to support a compatible ISDN architecture by 1990." Handler added that the major cus ers are large U.S. businesses, for who ISDN is still too expensive to declare DN is still too expensive to deploy wide "There must be value added for a cus omer to take on that expense," he added. ISDN must make available everything the customer has now, and do so at a cheap price." He predicts ISDN will be popular in the U.S. by the mid-1990s.

Handler said there must be a lot more cooperation between terminal makers and communications suppliers as well, be cause it is still unclear how standard customer-premise equipment will be. In the U.S., the ISDN interface resides in each nal maker's equipment rather than the network

These suppliers therefore must coop-erate to assure compatibility of their equipment with a standard ISDN version and to trim the flavors of ISDN, "Other-wise, we might have to put a glove com-partment into each telephone to handle all the needed documentation," he warned

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ca Communications, Inc. has ed two host modules for its Lat-emises and Department Concen-

del 407 Unshielded Twi Pair Host Module incorporates a pin Telco connector on the front panel maintains an orderly cable assembly polications of 25-pair bund at twisted pair, the comp

The Model 403 Attachment Unit

nterface (AUI) Host Module may be sed in Lattisnet Model 1000 Premises concentrators or Model 1010 Departconcentrators or Model 1010 Depart-ment Concentrators, the company sain. The product is equipped with a set of link status indicators, one for each of the eight channels on the host modules.

The AUI cables run a maximum di

The Model 407 is priced at \$1,900; the

A small computer systems interface (SCS) Hard Disk Installation Kit that was designed for unter of Novell, Inc. In Netware 2.1 has been introduced by Rancho Technology, Inc.

The software reportedly provides users with concurrent (O and is fally interrupt-driven. It is used to insertice as many and the state of the cess out transers. The ware in all tolerance and disk mirroring are supported.

The kit is available in several configurations and is priced from \$199 to \$245.

rations and is priced from \$1,900 access. The SCSI Netware 2.1 driver may be pur-chased separately for \$45. Rancho Technology, 8632 Archibald Avc., Rancho Cucamonga, Calif. 91730. 714-987-3966.

Local-area networking

fatinum Technology, Inc. has en-anced RC/Update, its software tool de-gned for IBM DB2 users. Version 1.3 is productivity-enhance ing software that was specifically devel

ing software that was specifically devel-oped for the DB2 database administrator. The product assists DB2 specialists by significantly expediting the process of de-fining and changing any DB2 object of even the actual data items storred in a DB2. database, the company said. In addition, templates of existing objects can be used to expedite the definition of new objects. New features include a data editor for

manipulating data stored in DB2 tables and an edit and browse option for the se-lection of an entire or partial DB2 table. RC/Update 1.3 costs from \$375 to

RC/Update 1.3 costs from \$375 to \$375 to \$400 monthly, depending on system configuration. Annual and perpetual pricing options are also available.
Platinum Technology, 555 Waters Edge Drive, Lombard, Ill. 60148. 312-620-5000.

s Software, Inc. has introduced a work group computing program for people, projects and time manage-ment within a local-area network environ-

ment.
Called Who/What/When Office,
the product coordinates employees on a
network and gives them dynamic acheduling capabilities for both people and resources, the vendor said. The program
will automatically check every entry for
potential scheduling conflicts, and shared surces such as conf ross such as conference rooms and ment can also be scheduled. The duct reportedly runs as a server-b dication on any DOS 3.1 compa work operating system. Who/What/When Office costs \$695 for

a 30-user, single-server site license and \$75 for each manual. Chronos Software, 1500 16th St., Su Francisco, Calif. 94103. 800-777-7907.

Network management

The Sniffer, a network m tool that pinpoints problems and analyzes performance, now supports Banyan Sys-tems, Inc.'s Virtual Networking Software

(Vines) server product.
Developed by Network General Corp., the product is said to support more than 50 network protocols and systems. According to Network General, devel-

ping network management software for nyan's server was a major project,

of protocols.

The Suiffer reportedly complexisting Vines network managements were by evaluating fine-tuning, ring and troubleshooting E ging and troubleshooting summing iBM's Token-Ring, Arcnet and Stariar that use Vines protocols. net works that use Vines protocols.

It also provides real-time monitoring of network traffic, including the types and

number of interchanges that take place between different nodes during typical network activities such as file transfer or electronic messaging.

Called the PA-1309 Banyan Vines Pro-tocol Suite, the software is available im-mediately for all models of the Sniffer and

is priced at \$1,995.

Network General, 1296B Lawrence Station Road, Sunnyvale, Calif. 94089, 415-965-1800.

tance of 165 ft as specified by the IEEE 802.3 standard, according to the compa-

odel 403 carries a price tag of \$975.

Synoptics Communications, 329 N. Bernardo Ave., Mountain View, Calif. 94043, 415-960-1100.

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C Immunoric. Inc. 1986, pitch depth with Manazinia. All Lawritive an imputed inclinated of Spati Computes has

Character I

Links

Multiwindow terminal emulation is fea-tured in Pacer Software, Inc. s latest release of its core Apple Computer, Inc., Macintosh-to-Digital Equipment Corp. VAX product. Version 5.0 of Pacerlink includes a refined user interface that en-ables a Macintosh to concurrently interact with multiple VAX sessions, the ven

Pacerlink communication to a VAX is accomplished via an asynchronous con-nection, Kinetics Corp.'s Fastpath Localhecton, kinetics corp.'s rasspati Locar-talk/Ethernet bridge, or direct Macin-tosh-Ethernet connection using cards from Apple, Kinetics, or 3Com Corp. Pacertink costs \$2,000 per VAX sys-

Pacer Software, Suite 402, 7911 Her-schel Ave., La Jolla, Calif. 92037. 619-454-0565.

oun Microsystems, Inc. has strength-ned its offering of IBM connectivity ducts with the introduction of its color phics IBM 3270 terminal emulator, Sunlink CG3270.

The product reportedly emulates an BM 3179G display terminal and enables ion workstation users to access IBM host

mainframe applications, including those that use color and host graphics. The unit features a what-you-see is what-you-get keyboard-mapping utility and mean-driv-on file transfer combilities.

teyboard-mapping utility and mean-driv-en file transfer capabilities. Sunlink CG3270 is priced at \$950 per terminal session, with discounts offered for multiple terminal-session licenses. Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043. 800-821-

ced Computer Communica-Inc. has enhanced the ACS tions, Inc. has enhanced the ACS 4020, the company's CCITT X.25-to-Ethernet gateway. The company said that the product can now connect to Public Data Networks and has been certified for use on GTE Corp. a Telenet and AT&T's

Accumet.

The ACS 4020 allows as many as 49 devices on a Transmission Control Protocol/Internet Protocol Ethernet to share a physical port on an X.25 network. The product reportedly provides transparent connection between the two networks and can support data rates in excess of

112K bit/sec.
Multiple ACS 4020s can be connected etween the same Ethernet and X.25 net work to support load-leveling and redundancy, according to the vendor.

The ACS 4020 costs \$10,950 and is

available in either a rack-mountable or stand-alone enclosure. Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101. 805-963-9431.

Modems/Multiplexers



A fiber-optic data multiplexer/demulti-plexer has been announced by Burr-Brown Corp.

The FMK800 was designed to pro-vide a high-speed data link between re-mote buildings and a cluster of terminal computers and ports, the company said.

The FMK chassis reportedly permits up to 16 ports and may be expanded to 64 ports.

All channels support full-duplex opera-tions at the maximum RS-232/V.24 data rate of 19.2K bit/sec., and each trunk line may extend up to 3.5 km, the company

The FMX800 price tag begins lower

than \$800 for the two-channel version. Burr-Brown, P.O. Box 11400, Tuscos Ariz. 85734. 602-746-1111.

Emucom, Inc. has announced the EM-1910 Mono Pad/Modem Enhancer. The product acts in conjunction with any standard V.32 modem to provide full, high-speed error correction out-dust X.32 igh-speed error correction mabilities, the company sa

capabilities, the company seas.

The device is reported to be operational at speeds of up to 9.6K bit/sec, while maintaining the CCTT X-25 standard. No operator intervention is required. Basic features include an asynchronous packet assembler/disassembler that is so: leatures include an asynchronous packet assembler/disassembler that is fully compatible with 1984 CCITT X.3, X.28 and X.29 standards.
The EM-1910 costs \$545.
Emucom, 25 Industrial Are., Chelmoford, Mass. 01824. 508-256-9871.

A 32-channel, statistical multiplexer has been unveiled by Micoun Systems, Inc. Dubbed the Micoun Box Type 6, the nit was designed to multiplex asynch ous and synchronous data simultaneo over a single leased line operating at seeds up to 19.2K bit/sec. or over a digi-

speeds up to 19.2K bit/sec. or over a disp-tal wide-band link operating at up to 72K bit/sec. The unit requires a single RS-223 or V.35 port and can be expanded with slide-is, 8-channel expansion cards. The Miscon Box Type 6 is priced from \$4.320 for an 8-channel unit, which in-cludes fixed command port and 72K bit/ sec. composite interfaces. Miscon Systems, Simi Valley, Calif. 805-883-8805.



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SX. Exactly what you (and the treasurer) have always yearned for: 386 power without the 386 price. For more information, call NEC Information Systems

at 1-800-343-4418. NEC Information Systems, Inc., Dept. 1610, 1414 Massachusetts A Mitel Datacom, Inc. has added two sta-istical multiplexers to its existing line of

The four-channel 5204X and the eight-channel 5208X both support asyn-chronous data rates up to 19.2K bit/sec. and provide a 19.2K bit/sec. synchronous ications products. site link, the vendor said. The multiplexers also accept an aggregate chan-nel input of up to 76.8K bit/sec. and can be used over single-hop satellite links for in-ternational transmissions. An enhanced High Level Data Link Control protocol is ntegrated into the units to provide error-

ee, end-to-end performance.
The 5204X costs \$1.195, and the 5208X is priced at \$1,595.
Mitel Datacom, Suite 553, Hallmark
Building, 13873 Park Center Road, Hern-Va. 22071.703-471-1000.

another option for its 5100 Series Fiber Optic Multiplexer. The Current Loop I/O Module is available in either passive (computer-end) or active (terminal-end) configurations, and each module delivers 36 channels through three 50-pin Telco connectors. All channels are said to support full-duplets operation. The product operates at 19.2K ht/sec. over distances of up to

According to the company, the prima benefit of the module is that users may

now mix RS-232 asynchronous and cur-The Current Loop I/O Module costs

Raycom Systems, 6395 Gunparis Drive, Boulder, Colo. 80301. 303-530-

A fiber-optic time-division multiplexer that allows six to 12 subchannels to be multiplexed on a single cable in synchronous or asynchronous mode has been an nounced by Rad Duta Communica as mode has been an-Called the FLM-2, the unit reportedly

mission speeds — via a rotary switch — for each subchannel to be set on its own independent bit rate. Additional features include an internal selectable clock, inter-

The FLM-2 is available in either a desktop unit or a 19-in. rack mount and costs \$665 for a four-wire twisted-pair

nfiguration. The unit costs \$890 for use th fiber-optic cables. Rad Data Communications, 151 W. ssaic St., Rochelle Park, N.J. 07662.

Diagnostic equipment

Advanced Computer Consulting, Inc. has announced a software product designed to provide an alternative to dedi-

ted serial analyzers. Called Serialtest, the program reportly allows a personal computer to be used for monitoring serial data communiusses for monitoring serial data commun-cations between two devices. The soft-ware's features in Jude pop-up menus and context-sensitive Help messages, and the product runs on IBM Personal Comput-ers, PC XTs, ATs and compatible com-

The system is targeted at engineers. software developers, system managers and field-service professionals, the ven-

Serialtest costs \$495.

Advanced Computer Consulting, Suite 101, 700 Harris St., Charlottesville, Va. 22001 804-027-4272

An Integrated Services Digital Network (ISDN) software package that provides decoding facilities and emulation for the LAP-D protocol (to 64K bit/sec.) and the Signaling System 7 (SS7) has been an-nounced by LP Com. a subsidiary of Tek-teonist Lee.

mix. Inc. The software will be shipped with al The software will be shipped with all new orders of the company's Tc 2000 in tegrated telecommunications analyzer. Combined with the analyzer, the product will reportedly provide an ISDN Primary Interface Analyzer with channel-drop and insert capabilities for any time slot that carries SS7 or CCITT X.25 data. The drop and insert feature also provides si-multaneous DS1/DS0 analysis and full dual-line support, according to the compa-

The ISDN software costs \$22,490. Tektronix/LP Com, 205 Ravendale Drive, Mountain View, Calif. 94043. 415 967-5400

Atlantic Research Corp. has expanded its Interview test equipment line to in-

The handheld device is said to provide data rates as high as 256K bit/sec. and in-clude 128K bytes of nonvolatile randomaccess memory. The product was de-agged for field-service personnel, data communications technicians and installation crews, according to the company.

The Interview 20 costs \$5,695. Atlantic Research, Teleproducts Division, 7401 Boston Blvd., Springfield, Va. 22153, 703-644-9190.



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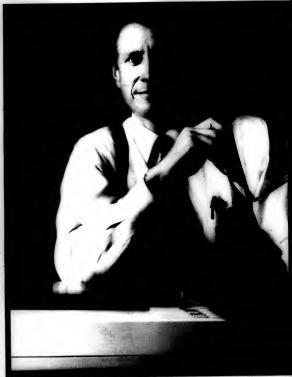
VIO — DOS/VSE Virtual Disk Drive. Moves the Standard directly into memory and allows for other heavily used non-permanent files to be moved into memory as well. PACK — Automatically compresses selected VSAM files immorpanent to applications and and users under DOS. PACK — Automatically compresses Iransparent to applications and and #WHOOW — Multiple terminal session at CRT under DOS or OS VTAM. #EDIT/DOS — The most powerful, I

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BY J. SCOT FINNIE

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agement: capacity planning netuser disposits and support; des Norwalls, Come, proteits that
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user technical support orderener
At that time, the full breaths
and the support of Al proteins and earl MIS support
at New Science Ausociates, Inc.,
to including database design tools.

INSIDE

Colloquial Expression

Buried Treasures New tools find potential in data-hases. Page 86. expert systems market that will total in excess of \$430 million,

Shower

FROM PREVIOUS PAGE

isted in the system, but wor s were unable to trace it. ers were unable to trace it.

As an afterthought one day,
Kumis tried Mindover MVS,
which incorporates expert system technology, and would up
solving the problem — a need
for added page data sets — in
two hours. "The next morning."

two hours. "The next morning," he says, "the executive director told me that other monitors of the system showed that the CPU uses literally breathing easier." Using Mindover MVS has also increased Kumin's understanding of the MVS system, he says. He just installed the product at Mony Financial Services in Securous where he currently in Syracuse, where he currently works.

erted Boole & Babbage's Ivisor, Carl Robison, DASD Advisor, Carl Robison, data center supervisor at Mor-ton Plant Hospital in Clearwater, Fla., avoided a shutdown of the hospital'a new IBM mainframe. hospital's new LBM maintraine. As operators carried out conver-sion from a previous mainframe system, they noticed a channel-capacity bottleneck brewing, a problem they were not expect-

ing with the new computer.

DASD Advisor "alerted us to the situation early enough that we will be able to add new chanwe mu oe note to add new chan-nels in time. If we had brought everything over from the old system without knowing, it's likely the whole thing would have just gone in the bucket," Bediene archiese

ed expert systems as

nology to the areas of resource

accounting and capacity man-Bachman's DBA (IDMS) and Data Analyst personal comput-er-based tools, which incorpo-

rate both computer-aided soft-ware engineering and expert systems technology, also fit into this category.
At New Orleans-based

McDermott International, Inc., an engineering firm, Mike Bare-field, manager of data administration, uses these products to help design and implement Cul-linet Software, Inc. IDMS data-

bases.

DBA performs database revision, which involves moving from the data description language of the database structure to the physical level of schematic

to the physical sevel of schemators diagrams, perhaps to the con-ceptual level of iconographic representations, and back again. After creating four databases in this way, Barefield sees pay-backs in a couple of areas. He is now able to produce several iter-ations of a database in the same ent of time it used to take to create just the initial version. As sult of this refinement, the

maintenance.

Perhaps more importantly, the products help solve another problem. "It is very difficult to find qualified IDMS database analysts," Barefield says. "With these expert DBA systems, I figure I can get away with having one or two fewer human database analysts. That's a substan-

tial payback."

In fact, the incorporation of expert systems in software engineering products is a burgeoning area. Transform Logic Corp. in Scottsdale, Ariz., has hired a staff of Al programmers to work out several aspects of the reverse-engineering product it is developing, according to Ron Davis, the firm's president and

chief executive officer. chief executive officer.

Cincom Systems, Inc. has embraced Aion Corp. as a member
of its CASE Alliance Program
and is offering ADS as a part of
its full-life-cycle CASE and appli-

cation development environ-ment. As part of this agreement, Cincom will be customizing ADS to integrate it with its other products, according to Dennis Butler, senior product manager

of application development to nologies. Even as expert system-based ag plications companies targe products at MIS/DP shops many expert system shell ven-dors are shifting their marketing emphasis away from special LISP-optimized platforms

Less than two years ago, only two well-known expert system development tools were avail-able for IBM mainframe comput-ers. Today, at least 10 such products exist, including several widely used workstation- and databases require much less PC-based programs that have

toward the main

been ported.

With mainframe tools becoming readily available, more corporations are using development tools to generate expert system applications internally. In some cases, the expert systems being created are directly applicable to MIS/DP functions.

Chevron Information Sys-tems in San Francisco, for exam-ple, has used Aion's ADS to produce an expert system for an internal network support appli-cation that, it is rumored, Chev-

internal network support appa-cation that, it is rumored, Chev-ron may decide to market. Another ADS user, Provident Life & Accident Insurance Co., headquartered in Chattanoogs,

creases the turnar PSB/PCB definition

More often, however, MIS shops are using development tools to create systems that offer knowledge-based support to other departments such as custo er service, und

as developed an applica On the verge

1% Al CAD/CAM,

Al vendors have not yet topped the largest single market for compu-services: DP/MIS departments, which spend 70% of all hardware

SOURCE DM DATA EN

tion that gives its MIS program-mers a way to create and change program specification block (PSB) and program control block (PCB) commands in a much more Before the development of

before the development of the expert system application, systems analyst Vicki Rosems says, the MIS systems people wrote all the definitions. Pro-grammers filled out request forms describing what they needed done, and changes were entered once a week.

The expert system at returns control to the IMS

At MCI Communications Corp. in Arlington, Va., for ex-ample, Dan DeSalvo, senior staff member in expert systems, is us-ing Alcorp, Inc.'s KBMS to dewelop a customer-service sup-port device. Known as Help desks, such applications are among the most commonly and easily implemented type of ex-

ert system.

IBM's Glendale Heip desk
sell — widely distributed with ESE, the company's expert sys-tem development product — was originally developed to





A hand on the switch

Companies seek lights-out goal with expert systems

A strong synergy exists between auto-mated operations and expert systems. The psybacks from expert systems in this area are as great as anywhere. Most ob vers place the average payback of a servers place the average payback of well-implemented expert system project at between three and seven times the initial investment. Some pundits have claimed the possibility of cost avoidance as high as 300 fines that investment.

Even skeptics admit to a likelihood of at least a 50% payback, which is probably much higher than most companies expect

om data processing automation.

For most MIS shops looking to explore spert systems, the goal is twofold, acrding to experienced users and consulits. First, the companies want to ad-

they want to move up the learning ave the io-h capability to spot

The pos of automating the

nt so completely that humans are er required for most operations — "lights-out," or automated, operns — is exciting and controversial for it companies. Although experts cau-that the reality is at least three to five ars away at progressive companies and lecade or more for the rest, such statistics have not stopped some con from gearing up for lights-out canal

Good storting point
MIS/DP-specific application products are
a good way for MIS shops to test the watern, according to John Popolisio, director
or artificial intelligence at New Science
Associates, Inc., a market research firm
in South Norwall, Coan. Such products
let MIS retain complete control of the expert system, he explains, and department
members have an excellent understandions of the sensition of

g of the application. ing of the application.

In Europe, where there is an extreme shortage of qualified technicians to run big systems, compasies like Societe Europeen Populisom (SEP) in Rongis, France, creator of the Ariane rocket, find that they must "use expert systems products rather than people wherever possible," notes Claude Genthon, head of systems staff. The problem is complicated by the firm's sociopolitical environment, which resists reducing manpower as a means of eving return on investment.

Thile it is not close to achieving lights

out, SEP has begun using an expert sys-tem from Paris-based Systar, Inc. The product, known in the U.S. as Daisy, is a erformance analysis tool that works in onjunction with SEP's Unisys Corp.

Texas Instruments, Inc. is considering Texas instruments, inc. is consouring several meass of exploring automated op-erations. "We figure that in five years, we'll be there," says Pum Fales, knowl-edge engineer at Texas Instruments, inc. "Data centers at many companies are trying to go lights out so they don't have 16

to 20 operators working during the week. But to get there, you need system moching to read the property of the property operations with the property operators aimed at MISOP customers, but it is actively developing in this area. It is concentrating on a line of 10 specialized tools being developed under what it calls the Automated Operations in the property of the Joint Development Pro-listed about 12 as-yet u

customers to share the costs and benefits of the joint development effort.

According to Mark Stoele, manager of knowledge-based spelications at IBM, "The eventual goal of most of the customers we are tailing to in to achieve light-out operations. We don't expect to see that in the next couple of years. It is a complex subject. But we think the things we are doing in this project now will play a

complex subject. But we think the things we are doing in this project now will play a key role in getting us there."

The product line IBM is working on is designed to dovetail with its mainframe system monitor products. Specific functions include real-time performance management, performance analysis, problem erting and documentation, problems, botch job management, netw

Help-chai diagnostic too.
Most which expert systems for inMost waithle expert systems for inMost work of the Chanch, but
BMS saste of products will be reading
real time on the MYS or VM system. To subsystem-centart capability to guard against lockout file system fails.
Steele notes that performance was the main reason for putting these products di-chain reason for putting these products of chiefe many of the stook to its joint devel-dence in 1989, with the bialance to come in

deliver many of the foots to its joint never-opers in 1989, with the balance to come in 1990. "Once they've been delivered to the joint development companies." Steele says, "then we will turn our efforts to making them available for general sale, hopefully not long afterward."

1.SCOT FINNIE



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Shower

CONTINUED FROM PAGE 78

dress a growing number of technical oport questions from IBM'a customers. Pam Fales, knowledge engineer at nts, Inc., is developing a

crass instruments, Inc., is developing a leip desk-type system to support the subse-based company's Information En-meering Facilities division.
"It will provide the first level of sup-ort personnel with an expert system to elsp them answer more difficult ques-ons. I think we will at least double, if not triple, the number of questions first-line operators can answer without having to

sees out technicians or oevelopers, Fales says. In Philadelphia, an example of another kind of expert system-based mainframe tool was formulated by Cigna Corp. Using Alon's ADS, Roger L. Schelm,

nt of appli ed research and exems, oversaw the devel

of an appl ed quarterly re-

what their cover age is compared with the industry Called MMI, or

Medical Manage ment Information, the expert system produces about 3.500 reports per year at a cost of less than \$1 per report. Previously, Cigna had two emoyees who were solely devoted to thi

Free-standing expert system applications are only a small chapter in the emerging story, however. A major impetus behind the development of mainframe-based expert system development took was the isolation of stand-alone expert systems.

The next logical step was to permit us rs to enhance existing applications with owledge-based components.
One of these products is Cullinet's

une or these products is Cullinet's newly amounced Enterprise2s, pert/MVS, a rules-based expert-system application development tool that is inte-grated with both the company's IDMS, DBMS and its ADS/Online fourth-generation development environment

According to Joe Carter, who heads up AI services at Chicago-based Arthur Andersen & Co., the determinants of success in expert systems are similar to those in real estate or retail: "With expert systems, however, instead of location, location, location, it's integration, integra-tion, integration," he says.

The trend toward integration also, to some extent, indicates a maturation both in artificial intelligence-based products and in the way corporate customers re-

nies interested in expert systems realize that this area is going to be as rategically significant a priority for em in the 1990s as the database was in the '60s, '70s and '80s, according to Tod Loofbourrow, a managing partner at Foundation Technologies, an expert sys-tems development and consulting firm in Cambridge, Mass.

[These companies] may have wanted

to get into artificial intelligence for some

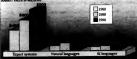
time, but the tools simply haven't been there," be says, "Now, they are finally beginning to see tools on mainframes that nercial quality.

What have vendors done to make their velopment products more attractive surrow, who edits the James Martin Productivity Series report "Expert Sys-tems and Al Toolkits," breaks the improvements into four categories: better performance, availability on existing busiess platforms, the ability to tap into commercial software in which corporate data usually resides and the potential to create corporate knowledge bases that may soon

rival the corporate database.

Ford Motor Co. in Dearborn, Mich., is testing that potential. It has been See them grow

het is expected to double within the next two years MARKET VALUE IN MILLIONS



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expert system that helps maximize revenues by better ging its inventory of over 2,000 departures per day. By effectively capturing and extending scarce human audit expertise, the Foreign Exchange Auditing Assistant developed by Chemical Bank has resulted in a 30-fold

neductivity incress: The Commercial Underwriter's Environment developed by Swiss Re Services automates decision making by reviewing several screens of data, gauging the level of risk, and recommending whether potential clients should be insured.

PRODUCT SPOTLIGHT

involved in AI-based products for several years and has implemented Los Angeles-based Inference Corp.'s ART-IM/MVS, a new mainframe version of the company's

ert system development tool Ford is part of a consortium of compa nies working with Inference; it also holds a small interest in the company. "Our in-volvement goes back a long way." points out Jim Cnossen, Ford's manager of manufacturing systems and operations re-search, "but what really excites us is the me product. Getting expert sysems on the mainframe opens up a whole te of new applications.

One of those applications is the knowledge base, or repository, with which Ford is currently experimenting. By translat-ing the logic behind a lengthy Cobol pro-

RTIFICIAL intelligence and expert systems are not yet beginning to catch on in business environments. Most MIS managers are taking a relatively cautious view toward this technology."

PORFRT ROUSE WASHINGTON UNIVERSITY

ram into the rules of an ART-IM/MVS knowledge base on the mainframe, Ford is attempting to create an application that is part database, part language and part

expert system. The Cobol program, which has been in use for several years, handles financia transactions generated from outside comnce of the program is dif-

panies. Maintenance of the figure, time-consuming and manpower intensive, notes Paul Duemler, project ager of artificial intelligence and exemler says he hopes to see many Du fits in the company's repository ap plication, including a reduction in the

maintenance effort and the time required to implement changes. "Putting new policies in place with En-

glish-type rules should be much faster than recoding the Cobol; it will also make the new process more self-documenting more auditable than the existing Cobo program," be says. According to New Science's Popolizio

the concept of the expert system shell as a repository of data means that "you are not only going to store information, but you are going to have a semantic under-standing of that information,"

On the brink
While few users seem to have discovered
them yet, there are other benefits of having new, sophisticated expert system
tools on stamfard hardware, where it can
interact with corporate data. Several ven-

At Digital Equipment Corp. in May ard, Mass., R. J. Mathew, manager of in emation systems and AI information systems applica tion mark

in charge of devel Like most v

dors targeting the MIS/DP expert tems area, DEC es few if any pro ucts on the arket yet. Its sol

offering in this area to date is a VAX per formance tool called VAX Performance Advisor. However, Mathew says he has several prototypes under development. For one such application, calle ICASE, or Intelligent Computer-Aids

Software Engineering, DEC is using Nex pert Object, a development tool from Pale pert Object, a development tool from Palo
Alto, Calif: hased Neuron Data; Inc.,
According to Mathew, Nexpert Object
becomes a liyer between a bottom level
of the VAX's VMS interface and a top level
consisting of "a highly interactive and
graphical user interface — creating a sort
of three-layer knowledge sandwich."
The structure of ICASE allows users

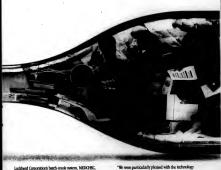
to press a button and move from that pro-gram directly into Nexpert Object and back again, he says. "There is nothing to say that we couldn't extend that knowl-

edge base to some area of VMS; it could be an envelope for all of VMS." Such fluidity is not limited to the VAX. On an IBM mainframe, several products, including Nexpert Object - which was recently announced for that environment

— and Alcorp's KBMS, are capable of automating the process of communicating with many software programs and lan-guages, including Cobol, IBM's DB2 and SOL/DS.

Larry Harris, founder and chairman of Alcorp, says such shells are able to create a mediating layer in Mathew's "knowl-edge sandwich." While the layer has little to do with traditional concepts of expert system functions, it essentially gives MIS shops the potential to make SQL their ndard data-manipulation language — a level of integration that most have not expected to be able to reach for several

Now and then It is still far from a sure bet that all the d rect attention currently being paid to MIS interests will pay off in major gains for the Continued on page 96



reduced the workload of medical claims auditors and improved their effectiveness by automatically reviewing all claims and identifying the questionable ones for review.

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The Expert System Experts*

AI adapts to use of the vernacular BY HARVEY NEWQUIST

During the mid-1980s, artificial intelligence — the sheltered child of research-based computer scientists for most of its exisnce - snuck out of the house othe real world.

and into the real world.

In its eacape, however, Al brought with it more than its fair share of hang-ups imposed by its academic parents. The most notable aspect of this upbringing was a pervasive sense of snobbishness about which computer

HAT HAS caused LISP. Prolog, OPS and a number of other AI-oriented languages to go from exalted to exhausted in less than 10 years? Plenty.

programming languages were considered apropos when creat-ing an AI system or application. ing an Al system of appocation.

Early discussions of the merits of languages approached religious fanaticism in two camps: those who preferred LISP and those who advocated Prolog.

Throughout the early and mid-1980s, these two AI lanmid-1980s, these two Al in-guage teams refused to believe that any other programming lan-guage could be effectively used for Al. To them, it was a given that either LISP or Prolog would whitensteed dominate a world are. ultimately dominate a world anx-iously awaiting true intelligence in a machine.

Time has proven them wrong. Not only is Prolog all but invis ble in the mass market today, but LISP itself is in deep danger of being sent back home to live with its academic parents. Why? One reason is that early vendors and developers failed to understa developers finied to understain that the mass market was not go-ing to convert billions of lines of Cobol, Fortran, Basic, C and oth-er established languages into LISP or Prolog just because re-

What has caused LISP, Pro-log, OPS and a number of other Al-oriented languages to go from exalted to exhausted in less

than 10 years? Plenty. Neither LISP nor Prolog works very well on mainframes or most IBM-class computers. Early buyers of LISP found that to run the software, they also had to buy a LISP machine with an average price tag of about

Newquist writes and consults on artifcal intelligence and other advanced sechnology topics from his office in

\$100,000. Even then, a LISP-

based application wouldn't work ing into stand-alone Al lan-with any installed base of com-guages and the resultant sysputer systems normally found in data processing centers. crporate users began to realize the fallacy of spending

difficult for both users and ven

hundreds of thousands and even millions of dollars for computer systems that couldn't be inteer systems — primarily because LISP was used as a starting

point.

In addition, the scarcity of
LISP followers in mainstream
computing made commitment to
LISP .technology increasingly

dors. A conservative estimate put the number of qualified LISP programmers in the world at fewer than 10,000 only a year ago. That is obviously not very many in comparison with the number of people doing Cobol, C

or even Basic programming. Since the end of 1985, when expert system developer Tek-nowledge, Inc.'s major share-

Announcing TI's Fourth Artificial Intelligence Satellite Symposium.

MAJOR MARY KAY ALLEN, U.S. AIR CHANDRASEKARAN, OHIO EDDIE CHAPMAN, BOWATER EDWARD FEIGENBAUM, STANFORD **ED MAHLER, DUPONT** MARVIN MINSKY, MIT **NEWELL, CARNEGIE-MELLON** REDDY. CARNEGIE-MELLON RICH. MCC - HERB SCHORR, IBM -JOHN SCULLEY, APPLE COMPUTER TOM SCHWARTZ MIKIO SHOJI, KAJIMA PERRY THORNDYKE. CORPORATION **BASE AKTIENGESELLSCHAFT** COOPERS & LYBRAND ELOQUENT SYSTEMS GENERALE DE BANQUE - MCDONNELL DOUGLAS NIPPON SONESTA INT TIONAL HOTELS UNITED AIRLINES strongly suggested that Tek-nowledge start developing applitions in C, many in corporate merica have been saying no to ecialized Al languages. As a sult, many Al developers are coding and rewriting their programs and packages to integrate into existing markets and soft-

Even vendors of strict AI lan guages such as LISP, Prolog and OPS are now willing to concede that the market for these lan-guages is limited, composed mostly of scientists, engineers and researchers. The remainder and researchers. In e remainder want mainstream capabilities and are willing to sacrifice fea-tures for speed. Today's Al products written in more traditional languages may not be as fully featured as their LISP or Prolog counter-

rts, but they run faster on

dead languages; quite the con-trary. LISP is still one of the best noon representation lan-ges ever created, and LISP

uite computers. As for Prolog, it res one of the most efficient too ent tools for

such as parallel processors and beefed-up workstations still pro-vide a good environment for us-ing LISP and Prolog in applica-

Furthermore, LISP is having something of a renaissance on micros. This is due almost exclu-sively to the introduction earlier this year of the Texas Instru ments, Inc./Apple Compute Inc. hybrid — the Explorer -

and last month's announcement by former Al beavyweight Sym-bolics, Inc. of its LISP board for the Apple Macintosh, the Mac-ivory. (Ivory is the name of Sym-bolics 'LISP chip.) Why the Macintosh? Essen-

why the Macintoshir Essen-tially because its interface close-ly resembles that found on most LISP machines or high-level workstations. In addition, the Mac II is constructed around the Nahus architecture, which Nubus architecture, which was the foundation for TI's LISP machines in the early 1980s. Thus it forms a natural evolution for

OT that LISP and Prolog are dead languages; quite the contrary.

npanies that wish to have aller but more general-pur-le LISP machines for applica-

tion delivery.

It is especially important to note that C and Unix have been winning big Al support, especially from inference Corp., here to but Micropystens, Inc., IT even has Unix nability on its Explore I machines. And though micron now make expert system development and delivery possible at all levis, this doesn't mean that upocalisand LISP machines will pa no short support to the control of the control

A new generation
Overall, a new generation of AI
vendors — as well as a revamped generation of older vendors - is taking over the Al

landscape.

All Corp., All Corp., All Corp., All Corp., Inc., Neuron Data, 1 st. Class Systems, Inc. and even Apple, IBM and DBC are trying to put Al into the mainstream. Refeorased companies like Inference and Teknowledge are taking the know-how that they acquired in the Al bosiness during the late it to 10 years. ing the last six to 10 years — as well as knowledge about the pit-falls — and applying it to the concerns of MIS and DP depart-

ments throughout the U.S.
As companies like Apple,
IBM, Cullinet Software, Inc.,
McCormack & Dodge Corp. and a host of other mainstream ven dors get involved with AI, the choices for users will multiply. The options will range from the choice of hardware platform to the choice of language. AI will become less of a specific technology and more of an application enhancement tool, allowing us-ers to create intelligent data-

ers to create intensions data-bases, spreadsheets and even in-ventory and payroll systems. Perhaps the best option will be no option at all: an Al application so transparent and function al that the user does not know or care - what language the program is written in. .

The Knowledge Worker Productivity Challenge. November 10, 1988.

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IBM MAIN-FRAMES

Look to corporate databases for decision-making material

BY TOM SCHWARTZ

Corporate databases represent rich and largely untapped sources of raw materials for decision making. Typically, these databases contain a wealth of varied information, including histories of loan applications, employment records, computer logs and a host of other data types from which a frame-word for decision making

can be generated. Few organizations currently make full use of their corporate databases for this purpose. Instead, it is more common for a my to try to access decision-making capability by using statistical or tradition-

ODAY, THERE are a host of PC-based products incorporating induction, genetic learning and neural networking that can discern solutions to problems as contained in historical databases.

al expert system techniques. Expert systems typically require ex-

tensive interviewing of a domain expert by an expert system analyst. The analyst takes the articulated rules for making the decision and places them in an expert system. In some cases, the amount of data is so overwhelming that statistical teche are used

While the expert system method re-quires considerable effort on the part of in expert and the expert system analyst, the statistical method calls for a lot of work to be performed by a statisti-Today, however, there are a host of

personal computer-based products incor-porating techniques of induction, genetic learning and neural networking.

These techniques can be used to re-

duce the amount of human labor that is re-quired for the task by discerning solutions ems as they are contained in his-

The savings that can be achieved with these methods are considerable. In in-stances in which measurements have been taken, a 90% reduction in human effort is common. Much of the expensive and time-consuming process of rule gen-eration is automated.

A quick prototype can be generated, tested and validated and then quickly turned into a working application. All that is needed is a statistically valid historical database of information relating to the decision area, a user conversant in one of the advanced approaches, and a subject expers to do a reality check of the generated

In theory, applying these AI methods to the decision-making process is easy,

Schwartz is founder of The Schwartz Associates in pain View, Calif., a consulting firm specializing in technologies that utiline expert systems and

but there is still some degree of difficulty involved in their use. Areas that must be carefully attended to include the follow-

 Problem selection. The kinds of inquiries best suited to these approaches involve structured selection, in which the mber of outcomes is limited; or mapping, a technique that involves finding

correlations that exist between elements Data set validity. Since rules and de

cision-making criteria will be generated from the information the system receives. the number and types of cases used to reach a conclusion or test the quality of a conclusion must be statistically repre

• Representation. With this class of tools, the key to a successful application is selecting the right attributes to represent

the problem accurately.

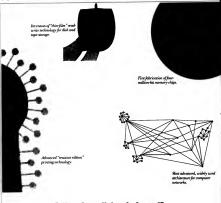
• Additional data collection. Most of the data saved by companies is done so for legal compliance, so some relevant data may be missing. In one case, the accuracy of a mortgage underwriting application rose from 53% to 78% after developers

added the gross national product and the inflation rate to the historical data set. · Ability to audit. Since most inductive

and genetic tools produce rules that are acted on by an inference engine, an audit trail and decision explanation are automatic. This is not true of neural networks, however. These products have not yet developed to the point at which they can explain how they got from the input to the

Keeping those caveats in mind, here is an overview of some of the available tools

Induction is a machine-learning techs that derives its decision-making capabilities from case histories.



"What does all this do for me?"

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ODUCT SPOTLIGHT

The earliest commercially available AI method of data extraction — an inductive algorithm known as ID3 - has served in the role of a foundation for at least a half

The easiest to use implementation of ID3 is found in 1st Class Expert Systems, Inc.'s 1st Class. The tool produces for ward-chaining rules from the input cases These rules take the form of a decitree, which can be edited directly in the

Last year, the company extended this feature in Fusion. This tool combines the capabilities of 1st Class with a code generator, allowing users to combine expert system technology with existing C or Pascal applications

An enhanced version of this technique

N GENETIC learning, rules generated at random are compared and ranked in descending order of merit, eliminated, reranked and retested until there is no improvement from one generation to the next in the correctness of the rule set.

is found in Intelligenceware, Inc.'s IXL, which combines an inductive method with other statistical methods. This product allows users to specify the importance of relationships and to commit resources to discovering rules that use an attribute based on that attribute's influence on an

The most popular induction-based de-

cision-making tool on the market is VP-Expert from Paperback Software Interational. Available now for the IBM Personal Computer and soon to be available for the Apple Computer, Inc. Macintosh, VP-Expert uses the Kavanaugh Map, a method that reduces the logic rep-

resented in the cases to its simplest rule

Genetic learning is another method for deriving rules from data. In this method, rules generated at random are compared and ranked in descending order of merit, eliminated, reranked and retested until there is no improvement from one generation to the next in the correctness of the nule set

There is currently only one commer cial tool of this type available — Beagle, a knowledge-base generator from VRS Consulting, Inc. On the surface, genetic learning in the product is similar to ID3, in that historical examples are entered and rules are generated. However, ID3 learns by comparing an attribute with a constant, whereas Beagle compares and com bines the values of attributes with other

By definition, Beagle is not an expert system, since it offers no inference enne. Instead, it can produce the rule set in Fortran, C or Pascal for embedded applications.

Neural network tools One way of viewing neural network tech-

nology is as biologically inspired statistics. This capability is based on the ability of humans to associate incoming stimuli with similar, although not necessarily identical, stimuli identified through past

experience. Stephen Gallant at Northeastern Uni versity has developed a two-part neural network expert system, Dumbo and Macie, to meet the challenge of the neural network's inability to explain how the val-ue of the data offered influences a deci-

Dumbo takes data and derives the knowledge base in matrix form, from which the decision-making canability is

Marie, or matrix-controlled inferen engine, is the runtime and explanation section of the expert system. It combi the matrix generated by Dumbo with its own inference engine to form an expert

While not yet commercially available, Gallant's method has the potential to make the use of neural networks in knowledge acquisition more approachable and allow the network to explain its decision making

Other companies that are commercial Other companies that are commercial-ining neural network technology are addi-tionally attacking the explanation prob-lem in hopes of expanding their market. These firms include Neuralware, Inc., Nestor, Inc. and Hecht-Nielsen Neurocomputer Corp.

Commercial use While these forms of rule generators are

not well known, some are widely used. For instance, Du Pont Co. uses 1st Class and VP-Expert in a variety of diagnostic applications. In one case, the subject expert for a Mylar manufacturing machine tried to build an expert system using contried to buisd an expert system using con-ventional rule-based expert system tech-niques and failed. However, with the help of these products, an example-based pro-totype was running in one afternoon. "Mining" databases through the

methods of rule generation described here may not solve all problems and cure all ills, but it does allow users to get a run-ning start on building an expert system. While each of these processing paradigms requires substantial human-defined precessing to work, the effort inolved ssens with each improvement of tech

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There's reason beyond rules BY SARA SPANG

The thousands of commercial expert systems that now exist represent only a siver of the potential applications. Current commercial technology alone is rich enough to accommodate many additional applications. However, developments in programming techniques to represent - nowledge and reasoning will considera-

Interesting and reasoning war consourably expand the scope of expert systems.

One major factor in the success of an expert system is how well the programming techniques used to encode knowledge and reasoning suit the application at

hand. These techniques should match the way people really think and do a job or solve a problem. When the technical paradism does not match the problem, a sys-

solve a problem: When the technical paradigm does not match the problem, a system will degrade quickly.

So far, most commercial applications depend on a limited set of techniques. The

most common are systems in which knowledge is phrased in terms of rules, formal logical relations, frame- or objectoriented paradigms or combinations of the above.

There are, however, new paradigms of

knowledge representation and reasoning on the horizon. These have just emerged or are about to emerge from the research world. Once commercially available, they will increase both the types of problems addressed by expert systems and the case of programming.

Open a new window
Randy Davis, a professor at MIT's AI
Laboratory, began looking for new modes
of knowledge representation and reason-

of knowledge representation and reasoning in 1981.

As Davis saw it, traditional expert specific control of the control of the

AS LEVES HAW II, TERRITORAL EXPERT SYStems usually expressed knowledge in the form of rules based on empirical associations coming from experience with a perticular task or problem domain. This approach makes the most sense for

problems in which expertise really does consist of such associations. However, it can be limited if a problem exists in the absence of experts who have built up a repertoire of experience. Furthermore for more abuilt

erfoire of experience.
Furthermore, for many physical devices such as circuit boards, an entirely different type of knowledge is available. Since we know how these devices work and understand their structure and behavior, we can use this information to support a more powerful form of reasoning

port a mode powerma sorm or reasoning than one based on empirical association. Davis uses an approach called model-based reasoning to express the underlying causal relationships among components of a device. When a system is developed based on a model of the device, it can reason not just by relying on empirical connections but by knowing "how thinse work."

odeveloped based on a model of the device,
it can reason not just by relying on empiric
cal connections but by knowing "how
things work."

During the past several years, David
group—and others at places like Xerox
Corp, a Palo Alto Research Center and
Stanford University — have been developing model-based systems, focusing on

HEN A system is developed based on a model of the device, it can reason not just by relying on empirical connections but by knowing 'how things work.'

the design of circuit boards as an application area for this type of research. This work has been supported by Digital Equipment Corp., the Defense Advanced Research Projects Agency and Wang Laboratories, Inc.

A new company formed by several even free many engineers, Al Squared, inc. in Chelmidord, Mass., recently shipped in first commercial expert system special forth conversed with model-based reasoning, but the converse of th

tals by Lewswise, I reals-selded infection Systems Support, I.e., a company the polymen Support, I.e., a company the and emedical instrumentation in hospitals. All Squared started with a disposition spitcation for CAT scamers called Felix. In lies that make mendath, the company best work system using Cololine Common Law Catter and Catter and Catter or it also ported the system to Lead Common LSP to run on Sam Microsysrems, Inc. workstations. Pietz has also the control of the color law Support and Support and Support als Topured in sits foliation for funds to start a marketing arm to class.

for funds to start a mannous account of the velopits own products.

Xerox PARC in Palo Alto, Calif, well known for its innovative multidisciplinary approach to Al, is also forging ahead with research in representation and reasoning. One major application area is the process of equipment design. Current efforts use techniques for reasoning by analogy along with model-based reasoning.

Spang is editor-in-chief of "The Spang Robins Report on Artificial Intelligence" in Mento Pa

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regul than no the rule or frame-ned models of traditional ex-rt systems. When human ex-rts face a difficult design oblem, they often look to anal-ous problems to find their so-

d as a source of analogies when there are problems with a specific design. To do this, re-searchers are creating inter-faces between the general and specific knowledge bases.

Makes world go 'round In financial applications, Price Waterhouse is contributing to the search for new techniques

the search for new techniques for knowledge processing. At its Technology Centre in Membo Park, Calif., the Big Eight accounting firm has launched a major effort to incorporate AI techniques into the software systerms it uses for its auditing, tax planning and consulting ser-vices. The goal is to improve the quality and efficiency of these

Although this charter may and rather limited, the comexity and diversity of knowl-ige to be processed in these sptions requires innovative arch on knowledge repre ignificant impact. Richard Fikes, principal sci-

entist at the center, empha-that difficult technical probl ed in representing such ledge. He and his project describe an object from multiple perspectives and find al-ternative simplifying abstrac-tions of complex descriptions and problem-specific default de-

scriptions.

Fikes' group is currently working on a prototype of an international corporate tax planning system, from which new ideas for representation and rea-sceing are likely to emerge. on, the new techniques for ling knowledge that are de-

ng in research settings will n to crop up in the man both as new tools for develng expert systems and as en-cements to existing tools.

Alain Rappaport, president of suron Data, Inc. in Palo Alto, as already said that techniq sch as reasoning by anak h as reasoning by analogy, ning by discovery and choos-among multiple problem-ring paradigms will be incor-ated into Nexpert Object, ch is Neuron's application de-pment shell. Neuron Data has also created

Nextra, a tool capable of eliciting and designing knowledge. Nex-tra, with a high level of interacti-vity and graphical imagery, lets experts structure their

HE NEW techniques for handling knowledge that are developing in research settings will soon begin to crop up in the marketplace.

type of tool is excellent for highly conceptual, hard-to-formalize In the long term, Ra in the long term, Kappaport says be expects Nextra to serve

as a personal inhoratory in which one can discover common pro-cesses of reasoning in real-world eld new techniques of knowling that will emerge from real

ems has made the

mate human thought.

Such techniques will affect
the ease of both interaction and
programming, thereby making



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Expert system shells

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Days, be. 0000 200-5206	Expert System Orestoners Parkers	DOM PC, XT, AT, Compan, VAX/VMS, Uses machines	c	Jules .	Formet and lankword channes	Ten	Y==	Yes	Yes	7m	Yes	Yes	Any repeting under last opening	N-	Yes	Protes \$395
Set Class Expert Systems, Inc. 1908: 385-7723	Int Class Pages	Diss machines DM PC, KT, AT, PS/2 and compatibles	Pecal.	Examples, rules	forward and Inchward clausing	Yes	Ym	Yes	Tes	Yes	Yes	Yes	14-3. Disper III. my ASCII file	Mess, graphics	Yes	11.1%
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Inference Corp. (213) 417-7997	Automated Resenting Tool	Apullo DN 1000, DN 1000, BP 1000, Symboles, San J. San-4, VAX, TI Engineer I. II,	LISP	Bales forts, contaminates actions, stagement forward, backward channes	Pattern meathing, receptoris	Yes	Yen	Yes	Yes	Ten	Yes	Yes	Custom stanfaces for Oracle, legres, IMS, CRCS	Graphics	Ten	\$22,500- \$45,500
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	Pero System	Sector ELX	LEF	Process and have	Forward, buckward, second chaining	Tes	Yes	700	1	-	No	Yes	Major discharge	Name .	Yes	\$130,000
Contrological Corp. (200) 438-4020			-	Evine provide	Personal backers classing	Yes	Yes	Tes	To You	Yes	Ten	1		Marrie Street	Yes	SIEM, DOD (sectodos (sectodos) 2016 (MS-
Investigent Environments, Inc. (200) 256-6412	Crystal	SM PCs and compression with 350K of RAM		muse, rarehim	(ac colored	_	-	-					1-2-3, Symptomy Dheer III, DOS, or ASCE, C	Menn, town, propies, redister town, Ep-dep menn, reports, aduction		2946 OAS- DOSL 21.94 (OS/2)
Julius Person & Assessation, Inc. 14129 427 6042	Espet Sor	ESM PCs emops AT, PS/T	Perd	Empir	behatter odersor	No.	Tea	1	Yes	Yes	Option	Yes	Non-	Messes, prophins	Ton Ton	21,494
	Expert Edge	Compatibles	Pauni	Prim	Personal backwar channels	Yes	Yee	Lad	1	100		" .	1-3-3. Waterit, Disse EJ, say ASCII		1	-
EDS Corp. (312) 251-2621	1063.3	28M PC, XT, AT, PS/2 and compacifies	Asserbler	Ruies, Stames, Sects, objects	Forward, backward channing, record channing, blackboard	700	Yes	Yes	Yes	You	Yes	Options	ASCII files	Test, graphics	7m	\$1,496

COMPANY	PRODUCT	HARDWARE PLATFORM	LANGUAGEUSED	KHOWLEDGE	CONTROL STRUCTURES	INCLUDES CERTAINITY FACTORS	INCLUDES EDITING TOOLS	AND DEBUG FACILITIES	INCLUDES EXPLANATION PACILITY	EXPLAINS CONCLUSION REACHED	EXPLAINS INFORMATION REQUESTS	SAVES DATA FOR TESTING	SOFTWARE INTERFACES	TYPES OF USER INTERFACE	RUNTIME MODULE	PHG
Long-Correror Boart Inclinia 200: 220-0007	Perp	BM PC AT PSG with MS or PC-DOS	с	Dán	Cliphonel, roles, black control	Tes	107	Yes)Se	No '	Мо	No	C, DOS programs	Line teterfare	Мо	Serie.
206: 226-6097 Lightweve, Inc. p) 2) 966-5033	Esperi System Informace Engine (SSEE)	BM PCs remain MS- DOS	Pecal	If then rule structure	Softward channel, otherwise regime	Mo	Tes	Tes	Tes	Te	Te	Tes	Ness	Messa, graphes	Tes	\$545
Laplcovere, but. 4160 672-0000	Trace	IDM MYS/TSO. YMACHES, VAX., off Son, Silcon Corplex; off, off Apade, temprised Scientists., Televronic, SP 366, CDC, Cyter	Mirales	Protes, roles	Forward, Indianal Channel	Ton.	Ten	7m	Tm	Ter .	Yes	Yes	Fotres, Calad, C,	30	Yes	B48,500
	Mirang	Integrated Scientisms, Taberman, 187 360, CDC, Cytler SIM MYSYTSO, VMACHE, WAX, San, Agech, IDT, Televanie, MF 360, Safero Cougher CD, Integrated Selection, Cytler, CDC	c	Protein, robe	Fermed lackword change	To.	To	Yes	Ten	Ten	Tes	Tes	Porton Colol, C.	10	Tm	\$68,900
Machine Intelligence Corp. (516) 560-1676	Mare	EM PC, XT, AT and compatibles	c	Sempette net, frames	Forward, backward classing, certificate factors, flow control	Yes	Ter	Yes	Tes	Yes	Ter	Yes	None	Mosc, graphics	To .	\$0,790
15161 560-1676 16085, Inc.	Comi	BANCET, AT, PASS	c	Edm	Sew control Forward, backward channing	Tee	Tes -	Tes	Tos	Ten	Ton	Teo	Chose III + , MEGS III, Exemistration III.	Mare, saturd language,	Ton .	86.500
	Espert-2 as MONSForts	TAXAVIAN San Union Bind PC, ET, AT, PS/L, Tundy TRS-40 1, 2, 4	Merid	Sale-based	Buckward channing	Optional	Ten	Tes	Ťes	Ten	Ter	No	100 Perhelium/L 100 Perhelium emesses und	Mens, graphics, second internet	No.	\$250-\$1,250 (m)tolog
Miller Microcomputer Services (800) 653-6136	MOSFeets Intelligen	PS/2, Tandy TRS-80 1, 2, 4 PRM-PC, ET, 87	c	Bites	Parent, backward	Tes	Ter	No	No	Ten	Yes	Yes	ASCT Ges	Person, pap-up	Yes	Settle
Mind Path Technologies (214) 223-0206 Mountain View Press, Inc. (415) 961-4103	Espet 2	BM PC, XY, AT, PS/2 and compatibles BM PC, Apple II	Furth	Print .	Statute Change	No.	Tes	Ne	Yes	Tes	No	Yes	107	NP .	Tes	\$150
(415) 961-4103 Mystack Associates, Inc. (203) 973-0075	Aurera	Xerus 1100, IRM PC, VAX	hawing. Common	Production role	Forward, backward change	Tes	Yes	Ten	To-	Yes	Yes	NP	LISP, Common LISP, C	Ecylonel, more	Me	\$1,500-\$0,000
Neuron Data 1415/331-4488	Nespert Object	IBM AT, PS/L. Macroscob SE, E, DEC TAX. Variations under VMS and Ultrie, Sun, HF, Apollo workstreen, IBM ET under AEL, IBM	C C	Bules, objects	Forward, technical channing	No	Yes	Te	Ten	Ten	Tes	Ten	Eart, 12-3, East Plus, Syparcard, Gracks Sybane, Ingres, OEC RING, Disser SE, Dissy Vacon	Graphics.	Ten	\$1,616-\$0,000
Proportional International (415) 644-3114	W-Espert	VM BN PC, XT, AT, PS/7 and companion.	c	Bales .	Perward, inclusive classing	Yes	70	Yes	Yes	Tes	Yes	Yes	Any DOS- essociable file	Text. dynamic graphics, washing, pull-desire station, mount	No	ine
Prediction Systems, Inc. (201) 223-5000	General Simulation Systems	Movets	PSI einstitute language	Expert system, detabase	Metardical	Tes	Yes	Yes	Yes	Ter	Ŷes	Yes	NP	Mem, graphes	Tes	\$19,000
Production Systems Technologies (412) 083-4000	OPSIA	Aprilo, ATRY 18. ATRY 6306, HP 9006/200. Sm. EAX, MS-006. US2	c	Dalas .	Ans .	No	No	Ten	No	No	No	No	c	10	Tim	52 006- 509,000
Quantum Inhamovations Corp. (406) 496-6933	Pre-Canaras	SEM AT, PS/2 Model 50 and higher, 284.	c	Ospecto, redes. vacables, randels	Forward, becomes change	No	Ten	Ten	Tes	Mo	No	Ten	5Qt, as/Oracle, DB2, talannin, C	Wodows, Astes, spenddown.	Ser	\$4.996
Radio Corp. (SLD 484-4797	Bulemanter 3	2000 PC, XT. AT.	c	Suice, expensive	Forward, backward channing	Ym	Tes	Ten	Yes	Yes	Yes	Tes	Any ASCIT Cle. Ele- ther, can be called from C.	Man, wadow	Yes	5450
	Balantator 3	Cylur 861, 990, 205, YAX, HP 9000, Aprilo, Sun westernisms, Manucaup, Uninys XX/150	c	Rain, complex	Farmed, backward channing	Yes	Yes	Tim	Yes	Yes	Ten	Tes	Any ASCE Six, Six that can be called from C	Mens	Yes	\$7,500- \$26,000
Smart Communications, Inc. (212) 480-1804	Smart Expert Editor- Smart Translators	SM PS/2, TAX, Units	c	Lencal tokens	Rule base linked or detailmen	Tes	Tes	Tes	Tes	No	Tes	Tes	ANSEC, THE SYID, VMS VMCMS	Since	Ten	\$12,500 hrs rapen eddin pschage:
Softepor, Inc. 02120-000-2000	Supersepert	Harintonia, Marintonia, Marintonia Pless, SE, E	Pacal, Forth	Exemples	Forward, backware classing	T-	Yes	Ma	Tes	Tes	Yes	Yes	Any ASCII Fü	Manu	No	1199
Software Architecture and Engineering, Inc. (103) 276-7918	Knowledge Engineering System	Elbé maintenance, PCs and compacibles. Apolin, 167, Saltons Crapitos. VCL under YMS and Ulas, Could Provention, any Unitrys, CDC Cyber.	c	Pulse, description classes	Ferward and backward channing	To.	No	Te	Yes	Yes	Yes	Te	Apps Sie that can be called from C	Meny-driven tool queries, graphics opposed	fe	\$4 600- \$60 000
Equipment Software International (415) 665-3635	Micro Mind Exercises	EBM PCs	NQ LISP	Spin	Forward, backware channels	Yes	Ten	In	Yes	Tes	Tes	Tes	1-3-3, (Name	Mess, graphers	Tes	\$0.995
(415) 665-3635 Symbolics, Inc. (617) 661-7500	Engravering Tool Joshus	Symbolics 3600	Symbolics Common LIS	Statement- terroried language object-exected	Forward, backware channel	No.	Tes	Yes	Ten	Thre	107	NP	Symbolics Self-ware System	Genera star asteriace	Ма	\$15,000
Tobasetelps, Inc. (419) 434-6600	M.1	State PC and companion with 5125.	e	Rates	Suctivari channal pattern manching	Yes	Yes	Yes	Yes	Ten	Tes	Tes	Cilies	Menus, application can substitute over starriage	Ме	\$2,000
	5.1	NAX Marrows, NCI Town, HF 9000 200, Agello Descrie EL Angia, Sup-3, 120 AT and compatibles	c	Date	Procedure calling procedure, calling	Ten	Ten	Ten	Tes.	Tes	Yes	Yes	C film	Mouse, application can substitute our uteriors	Ten	\$15,600 (PC \$29,000 (mastrome)
	Cigerian	TAX Microsope, Sun, Apolog Channel EX, Augus	c	Date	Perward, backwar channel, stracted precedure, called procedure, called	7-	Tes	Tes	Ten	Yes	T-	Yen	Cities	Monas, application can substitute our estardace	No.	\$30,000
Texas Instruments, Inc. (800) 527-3500	Personal Consultant Easy	SIM XT AT PS/2 and competition with 512K	Scheme LISE	Frames, retur	Ferward, backwar channe	Ten	Tes	Yes	Ten	Yes	Yen	Yes	1-2-3, Disse, sep programs	Mess, graphics	Yen	3495

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San Indonesia Inc.	Partie Commission	ISM 100-, 700-hand mayer self	School LSSP, C	Proces, roles	Farmed, backward closing	Y-	Yes	The	1.	Yes	Y-	You	Any DOS program	Man, propins		\$1,160
	Procedure Consultant	Des AT, Phil. TI Productional and	PC Selama, C	Tree structure	Freit tree	360	Tax	No	Ton.	Tee	Ten	Tee		QBA project.	_	\$495
Thundertone/EFC, Inc.	Metamorph	Maia, more	C. assembler	Rules fromes	Forward, backward	Tot	Tes	Yes	Yes.	Tree	Tes	Ten	Until	Natural Inspirator protocols	Yes	\$5,000-bute (cense)
Transporter Corp. (214) 466-4361	Espert Thinker	MON PC XT. AT and compatible. PL/I	Compile Arity Proint Torto	Lege	Between desired	No	Tee	Yes	Tee		Tie	Yes	Any ASCE and the		Ne	\$140
Unique Corp. 213) 973-7000	523 II	SON PC. AT. Userys 8 series weekstytens. Uses projectes	c	Rules, frames	Forward and Incircum channels provehent control	Yes	No	Yes	Tet	Tes	Yes	Ves	C, Percel	Woulders -	Ter.	\$50-\$10,00
	REE	Experier, Explorer E. Lindonnia	USF	Roles_States	Forward, Incirent channing, across values, methods, 174th methodson politics, berwerds	No	Yes	Tes	Ton	Yes	Yes	Yes	LISP,C	Wandows	No	\$30,000

Shower FROM PAGE 81

beleaguered expert systems industry. Cigna's Schelm strikes an optimistic note. "Expert systems are very definitely beginning to take hold in corporate America," he says.

But skeptics still exist. At Ford, Cnosen and Duemier do not see expert sys-

tems taking hold across the country, although they re-main intrigued with the future

prospects.
"We may have had more bullish expectations a year or two ago about the number of applications to which

we could apply exsystems n says. "But I think we have learned a lot and have recalibrated our ex-

Robert Rouse, assistant dean at the School of Technology and Information Management at Washington University in St. Louis, goes a step further. He is the director for the university's Center for the Study of Data Processing, a 45-member consortium of Midwestern corporations that includes Anheuser-Busch, Inc., Gen eral American Life Insurance Co., Mc-Donnell Douglas Computer Systems Co., Monsanto Co., Raiston Purina Co. and

Southwestern Bell Telephone Co. Although he is bullish about the future, Rouse says, "Artificial intelligence and expert systems are not yet beginning to catch on in business environments. Most MIS managers are taking a relatively cautious view toward this technology. Part of that is due to the fact that they have seen a long list of 'revolutionary technolog over the years that have proved to be much less successful than advertised. One area that could use some bolstering, according to users, is the process of

importing human expertise into the knowledge base. That is still too much an art form cave Mirhael Saindon, principal consultant on expert systems applications at St. Louis-based McDonnell Douglas. "There

inst isn't a good mechanism yet for mapping concepts espoused by an expert into a rule-based processor. And if you don't map well, the system will give bad ad-

Pointed rose

For the long run, users and consultants paint a rosy picture of the integration of expert systems into the corporate data processing environment. Rouse says he believes that the number of expert systems will double every year or so for the next 10 years. "By the year 2000, there will be hundreds of thousands of expert systems being used by companies,

One of the most commonly advanced economics is that in five to 10 years expert systems may not be differentiated from other software because they will be built

into all the classic applications Moreover, Cnossen notes, "Maybe it will reach a point where just about anyo will be able to use an expert system prodct, just as they do Lotus' 1-2-3 now Users also liken the expansion of expert

systems to the wave-like advances seen in datarelational bases and fourthgeneration guages. now. many MIS shops may have had little

reason to become interested or involved with Albased products. They could be bal-

of discovery, however

According to Foundation Technologies' Loofbourrow, "This is the year that the indifference of MIS managers to expert systems will give way." If it doesn't, MIS is going to find other departments pushing ahead without them, he adds. The payback potentials are such that business people are going to take the initiative on their own.

anced on the brink

MIS managers who do take the initiative and examine the tools and applications that are available now may find some personal benefits attached to the search. such as Al-enhanced products that can lighten the housekeeping load around the data center •

ASK THE VENDOR

The following questions were solicited from users and conveyed to the vendors for responses.

Builders expect to re Level 5 rede-red and modified so that it will op rectly from a Po Larry Ef

Director of MIS

INC : INFORMATION BUILDERS, Look for this capability early next year We are currently working on the creation we are currently working on the creation of an embeddable inference engine, and once that is created, we will put one inside Focus. Level 5 currently has the ability to read and write Focus files on Digital Equipment Corp.'s VAX machines and mainframes.

Does Carnegie Group plan to pu the use of machine-to-machin teraction with Testbench? It

Allen Reid Project Manager of Al Technical Support Prime Computer, Inc. Milford, Mass.

CARNEGIE GROUP, INC.: Tests supports a callout mechan um that all user to start external progra Through callout, a user can start a pro-cess that queries a host machine through a modem and returns the response infor-mation to Testbeach. Testbeach the uses the information to guide the diagno-

Carnegie Group currently offers cus-tom extensions to the system that provide more functionality, and we are evaluating the market need for specific kinds of ma-chine interfaces. Based on market needs, the company will implement new func-tionality in both the interfacing and core diagnostic area

Does Aion plan on putting ADS on a

DEC or Sun Micro s, Inc. plat-

Stan Bronso MIS Direc

AION CORP.: Aion is o support of commercial data processing in production environments and is aware that these environments include non-IBM platforms. Today, however, Aion's prod-uct is delivered on PC-DOS, OS/2, VM/CMS, MVS/TSO, CICS and IMS/DC - all IBM systems running on IBM ha

Our customers tell us that application transportability between these platforms is a valuable characteristic. We believe that extending that transportability to in-clude non-IBM platforms, such as DEC's, uld increase our value to production ta processing.

Aion's long-range plans do include such support. It should be noted that there are also IBM platforms to which our product can be moved, such as the Appli cation System/400

Does Gold Hill plan on establish nal interface from a person ster to a mainframe for Gol

Ted Kar Lead Systems Designer Cigna Corp.

GOLD HILL COMPUTERS, INC.: In August, Gold Hill announced Golden Con-nection/SQL, a tool that integrates appli-cations written in Gold Works with SQL. For PC users desiring connectivity to IBM mainframes, this product will be IBM mainframes, this product will be compatible with DB2 relational databases and several IBM PC networking a including 3270 data streams and Netbios. ger services be As the DB ma available, Golden Connection/SQL

ort th

IN DEPTH

Look out behind

When the symptoms of software engineering troubles get more attention than the problems do

BY ASHER YUVAL hat are the real dems in prod d maintaining soft re? Does MIS some es confuse essential atic ones? Can you put aside probably the consequences of real problems — identify the actual problems and simply coherently

> If not, then in acquiring a computer-aided software engi-neering (CASE) tool, a methodology or any other software enology or any other software en-gineering technique, you may unknowingly be applying the right solution to the wrong need. A symptom is a "problem" about which you may ask, "Yes, but why is it so? What causes it to occur?" A real problem, on the other hand, is one about which ere is no further why to ask.

For example, software engi-eering problems have been deneering problems have been de-scribed as goals not yet reached by Doug Bell, Ian Morrey and John Pugh in their book. Soft-ware Engineering: A Program-ming Approach. But those are probably symptoms rather than real problems, since you can sim-ply ask, "Why haven't these

MIS' initial efforts in software ngineering, therefore, should tween these two brands of diffi-culties. Then, after being identi-fied and isolated, the real ems should be further divided into two subgroups:
• Environmental problems information systems. These are real problems, insofar as our ability to change the environ-

Yuval is president and founder of Meth oda Computers Ltd., an independent consulting firm based in Jerusalem.



ent is limited and, hence, asking why is practically useless.
• Fundamental problems, which, like natural lawa, stem from the very nature of the soft-

Water measure.

Ultimately, software engineering challenges can be properly broken down into symptoms, fundamental problems and environmental problems. All are identifiable. But whether or not identifying a problem is half a soidentifying a problem is half a lution is left for you to decide.

Symptoma
Once the symptoms are identified, then MIS can get to the real problems. Consider, for examre likely symptoms of larger Software cost and schedule

ation. After careful examination, you may discover that this problem isn't different from the more general problem of project management.

There are three classical ap-

in any engineering field: manag-ing a project by its activities, by mg a propect by its activities, by its intermediate products or by both. On the basis of the ap-proach taken, schedule and bud-get estimates can be made. Proj-ect management is feasible only when either the activities or the intermediate conductor for intermediate products are fairly well known. If this is not the case, then even the most sophis-

tem — using the latest PERT/CPM and Gantt tech-niques, an eight-color plotter and a dedicated 386 personal Consider, too, whether the

activities or the products in soft ware engineering projects are clearly defined before making a cost estimate. What methodology is being used to derive the ac-tivities and products? When and how is feedback from previous

of software projects are never accurate unless the discipline accurate unless the discipline

clearly defined. The fact that a great success in other engi neering fields should be a warn ing and not a comfort for soft

ire engineering. In short, software cost and schedule estimates are not real problems; they undoubtedly result from a more fundar problem — namely, the lack of a clearly defined software engi-neering discipline.

Lack of experienced pro-

there a lack of experienced proecause of a lack of experi-

which is prob true; or "It's a young industry,

Perhaps part of this problem

Getting back to basics

· Do sweat the details

· Right solution, wrong problem?

is that the profession is not de-fined well enough. Can MIS pre-cisely describe its different occucasely describe and specify their requirements? Are there clear and meaningful titles for these occupations? Can a DP project manager who wants to staff a tehm point to the various craftsmen required, their exact titles and when and for what tasks they are required? Is the title

"DP project manager" itself clearly defined? While the situation differs

from one MIS organization to another, on the whole, the issue remains serious. Since software engineering as a discipline is not defined, its different professions are not defined, either. And since the professions are not defined how can they be properly taught

Be aware, however, that the lack of professionals is not an es-sential reason for the poor state of software engineering. Other problems prevent it from becom-ing a well-defined engineering discipline, thus making it difficult

to teach and study. Software maintenance This symptomatic challenge can be divided into two categories: the disturbing distribution of the

cost between development (30%) and maintenance (70%); and the overall cost of maintenance in terms of money, morale and other factors.

Again, neither of these are real problems. First, as has been noted in Capers Jones' book. Programming Productivity, n maintenance is carefully analyzed and correctly split be-tween defect repair and en-

hancement, the picture radically changes and the true figures be-come development (50%), de-fect repair (14%) and enhance-ment (36%).

Second, the high cost of m tenance, as most engineers will probably agree, is actually the result of incorrect design. Thus the question in this case is, "What is the cause of bad de-

"What is the cause of bad design?" Is if due to the finalize to allocate enough resources for analysis and design?

Many MIS managers—
backed by heavy experience and plentiful literature— deny this consultility, claiming the 150° do the development effort already goes into analysis and design with no major impact on mainte-

Or perhaps bad design is the consequence of the rigid life-cy-cle model, which is unsuitable for changing

Whatever the reasons, soft ware maintenance difficultie are the result of more basic pro-

NSTEAD of dwelling on symptoms, MIS should address at least some of the problems facing its software engineering professionals today.

ms in the software engineering

discipline.

In a similar way, many other classical problems in software engineering — such as software reliability, software portability, performance, budget and schedule overruns and so on — are all

symptoms of more essential So instead of dwelling on symptoms, MIS should address at least some of the real prob-lems facing its software engi-

Environmental problems A handful of well-known prolems are actually environmental problems, especially those relat-ed to information systems in which there exists a close interaction between the computerized system and the organ tion's strategic and intrinsic

operations.

These problems can be characterized in terms of the interaction with the enterprise's functions and the interaction with other disciplines.
The DP field as a whole, and

software engineering in particu-lar, suffer from trying to fulfill expectations beyond their scope and capacity. In part, this is an artificial problem that stems from overselling DP as a solution from oversexing DF as a sounce to all of an organization's illness-es. At the same time, managing data in any organization is essen-tial; it is almost like managing the organization itself. Thus, it is



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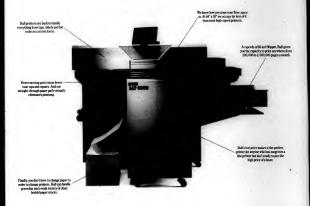
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o wonder that building and im-lementing an information sys-em requires talent, knowledge and power far beyond what soft-

MIS must make a major deci-sion in this regard: Should it ex-tend the software engineering discipline to cover topics outside its "natural" domain, or should it

disciplines (and if so, which ones?) and be ready to pay for such collaboration?

lem deserves serious consider-ation, although it has received little attention. It can be called the transparency problem.
"Transparency" in this case means the correspondence of the information system to the

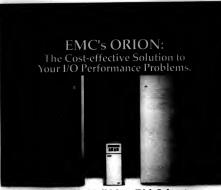
A software system with a high degree of transparency is one that truly reflects reality, wheretnat truty reflects reality, where-as a system with a low degree of transparency is one that runs parallel to the real world without corresponding to it. Modern corresponding to it. Modern banking systems are good exam-ples of high-transparency sys-tems; one may even say that the real world — namely, the actual money - is in the system itself

On the other hand, project les of low-transparency sys-ems — which may explain much their operational difficulties. of their operational difficulties.

MIS should try to categorise
the following systems in terms of
degrees of transparency: inventory, finance, reservation sy tems, comma ed and control and

But why is the transparency

issue important, and where ex-actly does the problem lie? In software engineering, the type of system we deal with is crucially important — as pointed out in Programming Productivity — and that is a fact MIS often discegards in the rush to build. Systems with low transparency are easy to build and maintain but may, in fact, be useless. Systems with high transparency may be difficult to build, and they are certainly difficult to enhance and



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HE GAP between software engineering and other engineering dislines is so wide that MIS should exercise caution before borrowing any idea from these disciplines.

modify, but they have high pros-

pects for success How to identify and measure a system's transparency and how to raise the system from a low to a high degree of transpar-ency are major environmental problems in software engineer-ing.

in software engineering include the lack of physical properties, the flexibility-to-rigidity shift, the transformation issue and the

informal-to-formal shift.

* The lack of physical properties, or more correctly the lack of natural objective properties, is well described in E. R. Fairely's Software Engineering Concepts. Although somewhat hard to grasp when first posed, it is so fundamental that it probable from the bening means to the form the bening of mean from the form the form

the gap between software engi-neering and other engineering disciplines is so wide that MIS should exercise caution before borrowing any idea from these

Engineering discipulations of the close sed as a result of the close interaction between natural science and practical engineering. At the very center of this fruitful no one very center of this fruitful interaction lies a shared body of knowledge to which many peo-ple have contributed and that has seldom been seriously chal-lenged. And when someone does well, such a person could only be an Einstein or a Newton. Instead of short-

Instead of physical proper-ties, substituted soft(ware) properties emerge, such as properties emerge, such as structured programming rules, data normalization forms and so on. If this is the right trend, then software engineering is indeed a unique discipline, the first of its kind in history, in which human

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Still, it is a fundamental prob-m, since even the shortest path stails at least three transforms

namely, good old compilers.
There is probably much to gain
by extending their power and introducing them earlier in the

m's life cycle.
informal-to-for
Another problem size is the informal-to-formal shift.
Informal, natural language i
still the best vehicle for commu-nicating. Without it no projec-ever gets off the ground. Mos-

ever gets on the ground now users prefer natural prose to technically sophisticated data flow diagrams. But somewhere during a soft

NE TRANSFORMATION has been accomplished with remarkable precision ever since computers were invented: namely, good old compilers.

nt in the project. teresting subset of this applies to non-English-countries. The inforve language used at the g of the project is later verted to formal software en-eering tools in English-like mats. A data entity, for in-noc, is first defined in a local

al in order to con ans n essential in order to com-municate with the user. Later on, that same data entity must be redefined and put into a database data dictionary in order to com-municate with the application

Unclassified problem In addition to the funda

The right computer could increase your bank's revenues by 20%.

several others that are more difficult to classify: a The "small" details prob-

• The "small" details problem. Anyone who has ever amiyaed a software system knows about those "small" nasty details that, if not defined to the very last bit, endanger the entire grand denign. This is a severe problem not merely for topdown approaches but also for any implementation of ordered proedures, such as life-cycle mods. This problem is unclassified scause it could be considered a raptom or a real, fundamental roblem in terms of the informal-

The user involvement is roblem. User involvement is ertainly crucial for a project's uccess. This may be regarded as a real environments is catche because it is difficult to identify the user throughout the entire life cycle. At the same time, it may be the result either of other environmental problems such as the interaction with the enterprise's functions or the

informat-to-formal problems.

The lack of a computer science. This problem is quite of ten cited as the problem in soft ware continuously and since it is

an "academic" problem, it appercently is fundamental. But surely one may still ask: "Why isn't a science being built around activare?" A possible answer may be that software lacks phys-

al properties.

Psychological problems.

prices problems, such as prossional egoism and reluctance

change, may be considered

ndamental by some. But these

problems may well be the resu of the flexibility-to-rigidity shi or the lack of objective software properties.

Philosophizi

cassiving source engineers seen somewhat philosophical, bu why not philosophical from tim to time in our attrition-consciou profession? Furthermore, the classification of problems gives yardstick by which to evaluat the different software engineer

ing tools and methodologies.

The cost of implementing these solutions is very high and far exceeds their purchase cost. Also, as noted in 1986 by R. Goldberg in the IBM Systems Journal, technology transfer—

HY ISN'T a science being built around software? A possible answer may be that software lacks physical properties.

particularly in software enginoering — is very alow, and the implementation of new ideas can take years. Knowing is advance which problems a software engineering solution intends to solve is, therefore, extremely impor-

neering solution intends to solve is, therefore, extremely important.

For instance, a proposed software engineering solution that promises to reduce maintenance

through CASE tools should comprise the following:

Clearly defined and easily measured software characteristics.

Flexible database and module definitions enabling changes as late as possible in the life cycle.

A minimum number of stages in the life cycle and a straightfor-

ward transformation stage to another. The differentiation

The differentiation of the control o

toms or real problems is perhaps also a function of time considerations. Applying solutions to symptoms can sometimes work quite well in the short run — for example, solving an immediate problem for a specific project.

production of software is an indispensable part of the business, and certainly for the software industry as a whole, the only effective and long-range solutions be in attacking the real problems, not the symptoms. •

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- · Ability to add up to 32

asynchronous devices, including minicomputers, PCs with async emulation packages, displays, and modems for dialin



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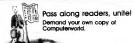
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SISP: Easier to say than do

planning (SISP) heads the long list of systems executives' con-cerns. Our recent study of 80 companies and their SISP experiences let us offer some insights and guidelines to avoiding ob-stacles.

SISP denotes the creation of a long-range plan of business ap-plications for a firm to computrize. It includes pinpointing new systems to help carry out the firm's current business strat-egy and conceiving clever ideas for systems to help it create a new strategy to outdo compet

tors.

Increasingly, companies are carrying out SISP studies. They are following complex, proprietary methodologies (IBM a Business Systems Planning) or customizing their own approaches. They are building teams of in-house systems managers and business managers, often in-cluding outside consultants, to help perform the studies.

These organizations spend lots of time and money on their SISP studies. However, the studies do not necessarily go smoothly. MIS executives of-ten complete them with disillo sionment and disappointment.

In order to learn about SISP, we used a list of 49 potential problems to ask MIS planners in 80 companies that re-ly completed a SISP study. wing are the 10 most se-

Year of renewal for the DPMA

The group scrambles to regain revenue, membership and recognition

BY JEAN S. BOZMAN

PARK RIDGE, III. - After 36 years, the Data Processing Man-agement Association (DPMA) took a long, hard look at itself in the mirror and did not like every-

thing it saw. A 1987 survey of 36,000 A 1301 survey of 36,000 members showed membership declining and a \$2 million budget that supported the 20-person staff at DPMA headquarters but could not buy full-time Washington, D.C., lobbyists.

Many DPMA mem faced their employers' ambiva-lence about out-of-town travel for DPMA functions. "The per-ceived value of DPMA member-



ship wasn't apparent to some employers," said Perry Baty, secretary of the DPMA's South-

clean up its house and to polish the perceptions about DPMA."
"We've called 1988 the Year of Renewal," said Christian G. Meyer, president of the DPMA. ose one-year term runs out in

whose one-year term runs out in jamusry. "For the past two years, we've been suffering a revenue loss that was due, in part, to the end of the National Computer Conference (NCC). As one of the four co-owners of NCC, we used to get \$400,000 to \$500,000 a year." As the DPMA was analyzi

the membership survey, it was thinking of ways to replace the revenue lost when the once-booming NCC deteriorsted, Meyer said. "The loss [of the

our situation a lot harder and quicker than we would have had that financial cushon been in place," Meyer said. The DPMA budget for 1899 is projected at \$2.5 million, slightly higher than the 1988 budget, he said. Money-making ideas have surfaced, though not yet imple-mented, Meyer said. Among them are establishing a for-profit subsidiary, creation of new man-

nt training and technical

Continued on page 109

 SIM honors Lithoms Lighting, Frito-Lay with les ership award. Page 108.
 Study uncovers key to smooth moves. Page 110.
 DPMA hot on the trail of legislative news. Page 109

Klitten exercises leadership at Chevron

BY KATHY CHIN LEONG

The physical and emotional test of the Vietnam War taught Martin Kitten many things. One of the things he learned while serving as a first lieutenant in the U.S. Army was the art of managing and leading a fighting force of people from all walks of life.

"Believe it or not, there are a

"Believe it or not, there are a lot of similarities between this job and my two-year role in Victnam," explains Klitten, president of Chevron Information dent of Chevron Information. Technology Corp. (CITC), a San Ramon, Calif.-based wholly owned subsidiary of Chevron Corp. "You learn how to develop a sense of intuition in various sit-tuations and to design consistent ustions and to develop people skills that you never thought you

d," he adds. Klitten has had plenty of time exercise his leadership skills. He arrived at Chevron in 1970 as a financial analyst and was elect-ed to the position of comptroller for Chevron U.S.A. in 1985. He was promoted to his current po-sition last November.

Those people skills are coming in very handy as the MIS sub sidiary serving the needs of Chevron undergoes a major re-organisation that will not see organisation that will not see completion until the end of the

This March, all 2,000 employees were informed about the restructuring that involved closing one and downsizing another of the company's four data central More than 50% of the work force will be affected by rede-

PROFILE Martin Klitten



According to the plan, the Houston and San Ramon data

processing sites will stay open while the MIS facility in the Continued on page 110





























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Creative execs cop SIM prize

Lithonia Lighting, Frito-Lay system builders lauded for work

BY JAMES CONNOLLY

MINNEAPOLIS - The creators of a cus MINICAPOLLS—I necreators in actions to the tomer information system that helped to increase one firm's revenue suicidi in sev-en years and a hand-held computer-based sales system credited with saving another sues system credited with saving another company more than \$20 million annually will be honored today as winners of the Society for Information Management's (SIM) Partners in Leadership Award. SIM identified the winners as Presi-dent Jim H. McClung and Senior Vice-

President Charles J. Darnell of Lithoni resident Charles J. Darnell of Luthons aghting in Conyers, Ga., as well as Plano, exas-based Frito-Lay, Inc. Vice-Presi-nt of Sales Operations Ronald A. Rit-nmeyer and Vice-President of Manage-ent Services Charles S. Feld. The awards, which will be presented at the an-nual SIM meeting here, are intended to honor executives from the IS community

and the user community who work in partnership to produce major results for ing the results of his firm's Lithonia Light Link and ACE+ systems, Darnell said, "The most important benefit is that it ties our information systems strat-egy in with our business strategy. The efit from that, in turn, is that it ties us closer to our cu

Competitive edge
Lithonin, a lighting equipment manufacturer and subsidiary of National Service
Industries, reportedly has boosted its
sales from \$96 million to \$559 million since it began using its first generation of Light Link systems on an IBM Series/1 minicomputer in 1980. Now based on per-sonal computers, Light Link and ACE+ have helped the company maintain a com-petitive edge by making it easier for cus-tomers to do business and thus maintain According to Lithonia, order process-ing has been reduced by one week to half of the industry average, with the company filling orders in a week regardless of customer location. Other effects of the m include: reduction of errors in orsystem include: reduction of errors in or-der specification and product design through knowledge-based technology; identification of new product opportuni-ties by automatically capturing customer inquiry information; extra revenue of \$3 million annually by selling spin-off infor-mation technology; conversion of a weekly invoice preparation process into a daily ocess; and generation of profits for

homis's customers Lithoms a customers.
The systems were designed to support the internal business needs of Lithonis's branch locations and agents, including accounting and personnel applications, as well as handling tasks such as on-line transmission of specifications, quotations, prices, orders, acknowledgments, order and inventory status.

ated for his con



minment to Light Link and his early work in soliciting company agent's viewpoints and needs. Dreated won nominated for his recognition of the valuable role PCs could play in the corporation. Proto-Lay's Rittensneys or PCs could play in the corporation of the valuable role PCs could play in the corporation of the valuable role PCs could play in the coloryonist of the valuable role PCs could play in the coloryonist of the valuable role PCs could play the could play the role point the machines in the hands of 10,000 route salas representatives.

Those computers are carried into re-tail food stores where Prito-Lay askes per-sonnel cuter information about the store's inventory and make their deliver-ies. The hand-held computer is attached to a printer in the delivery truck to pro-duce an invoice, and it downloads its infor-mation via modern daily into minicomput-rers located in more than 200 distribution

centers.

According to Frito-Lay, the system re-duces paperwork and errors and im-proves order tracking in the inventory-and ordering process, allows Frito-Lay to instantly download new product information and prices into the system rather than relying on order forms printed monthly and gives each sales representa-tive an extra three to five hours per week

to seek out new accounts or foster relationships with existing customers.

The company also said the system allows Frito-Lay headquarters to calculate sows Prito-Lay neadquarters to cacutate duly sales by category, channel and geo-graphic region within 24 to 36 hours rath-er than in one week; mositor sales suc-cesses and market trends within 48 hours rather than in two or three weeks, thus enabling manufacturing to immediately adjust production; evaluate promotions while they are ongoing; and save more than \$20 million annually.

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DPMA

Creating a higher profile im-age for DPMA will be a key ele-ment in DPMA's outreach to hundreds of thousands of poten-tial members nationwide. That is ciation is experi menting with videotaped mes-sages and redesigned publica-

DP management pie.

"It's a continual battle we fight," Meyer said. "But we're trying to broaden our market-place by reaching out to the user community. We're seeing many al analysts, who are managing information resources for tr first time. That kind of perso

needs the kind of support, exper-tise and networking that DPMA Saw it coming Even before the survey was tak-en, DPMA knew it had a problem

For the last 26 r there has been a spiraling down-ward in membership in DPMA, a steady decline," said Donald G.

er, national problem. "All associations are experiencing a declining or stabilizing memberahip," Oberg said. "It a corporation is feeling an economic pinch, it may put certain brings on a lattice, like attending out-of-town association meetings. Instead of four people, they might send as one person."

The DPMA survey: launched

in 1986 as the first in a series of such evaluations, showed that the problem went deeper. It pointed to the modest self-image of DPMA, which sits behind a car deslership in a suburb just west of Chicago. DPMA could have been making more noise, its

are," said Terry Felker, a for-mer Army information systems officer who is DPMA's national retary and treasurer. ng very ag

suive to make the association mater," added Wall Street pter President Richard Lefcomprer rrespont Richard Lef-koo, who has been a member since 1985 and is also a Citibant NA vice-president. "I would have joined DPMA earlier if I had known about them."

own about them."

One place the DPMA is lookg for new members is among
e ranks of upper DP manageent. While an estimated 70% of ment. While an estimated 70% or DPMA members work in operations or DP management, many are based in small- to medium

ed shops. To reach top IS profe rge organizations and to give iders a taste of DPMA, the ciation scrapped its *Data*

Information Execution.

To help time things around, DPMA also comulted with its senior advisory council of top MIS executives last year. Among those on the board are the following: Max Hopper, senior vice-president of information systems at American Airlines, Irwin J. Sikkin, vice-president of corporate administration at Acton Insurance Co; and Fred Meier. vice-president of corpo-

Unisys Corp.
"They are our sour

DPMA sprawi
Southern and Midwest chapters, such as Regions 3, 4 and 7, dom
DPMA membership, but all regions are represented



bout the issues and ask them to elp us plan for the future." The 5 members of the council are 16 members of the council are available for advice, even though schedules may keep them from DPMA functions.

The big payoff
As the DPMA's 37th annual convention is set to unfold in Dallas

m Oct. 31 to Nov. 2, the ass ciation's corrective actions seem to be paying off. By August, membership's downward spiral-ing had stopped, Oberg said, and September membership figures were expected to show an in-crease. The convention will crease. The convenient incohebly draw approximately

To spark user interest. DPMA management is patable DPMA management in patable proposed for special interest group, SSIG, "The networking aspects of DPMA meetings tends to breast down a little tends to breast down a little twhen you don't have common interests," Oberg observed. SIGs also give rank-and-file members leadership roles, something that was not previously available without deciron as a reviewing that was not previously available without deciron as a reviewing.

is not previously available thout election as a regional or apter official. There are six SIG groups, in-ning ones in artificial intelli-nce, office systems and tele-menunications. SIGs can be ed by any DPMA me

formed by any DPMA nember, provided be on attract 50 participants nationwide. As a grassroota expression of changing interests, SIGs are seen in DPMA as a way to stay relevant. "As long as you have an association that a piable, that it responsive, you've OK." Obergraid.

Before SIGs, the path to DPMA recognition of the piable of the pia

act of officers.
Beyond that; Bach chapter ap-points an association director to sit on the board of 280 directors at the DPMA's annual meeting. This group sits with the DPMA's management board at the annual DPMA convention, giving each chapter a direct view of the asso-

From Phoenix to Dallas to New York's Wall Street, 280 chapters meet monthly to dischapters meet monthly to dis-cuss DP matters over dinner and coffee. "You sit down to dinner with friends," said the Wall Street Chapter's Lefton. "You can speak your mind, express your concerns, and you get ad-vice and support in return with

no negative repercussions."
The freedom from worry about mistakes makes the discussion flow more freely at chapter meetings, said Michael Rossirio Isabella, association director at the Phoenix DFMA chapter. "But that was before my time," Isabella added, who joined the DPMA in 1982 as a

Tracking legislation

eleving in computer security is one thing. Trying get government to do something about it is another. This is why the DPMA monitors legislative activities wise. When a proposed law effects the data process wise. When a proposed law effects the data process mannity, the DPMA ensets the data process networker to take TDPMA ensets. It always need nembers are encouraged to make proposals to the

legislators is percon. This is what happened after the federal government passed a computer crime bill in 1965, fast after the federal act was possed, 1976A desired at mode law that coald be used as the "feet and the state of the state legislator from Minnesota call us, noting about computer crime bills," and loops E. Collins, who leads the DPAA governmental affairs office. "If think he ended up introducing our mode bill werbatum,"

to a temporary personnel and temporary control and temporary contr

ach, the DPMA forgoes having

responsive, you're OK.

The recent changes in DPMA rection are already bearing

At DPMA he byist on retainer. adquarters, Colli At DYMA newsparious, commerce are across the U.S. by logging on to an electronic detabase rimary topics of interest include laws affecting VDTs, commerce advention. Abstracts and security and computer educ

arrange, "We'll research any legislation related to competers," Col-or Officerd, adding that DPMA volunteers are always rendy to all envelopes for a computer-estated case. expert winds in a state's legislative committee needs an expert winds produced to the committee needs are expert winds. "We feet leatimony has more of an impact when it's coming no someone who scattling's conditioned in that estate."

ter, joining other large shops like he-wall it is," Isabelia said 'You can run it by 50 people be American Express which never went away." Meyer said his career blos-somed after he joined DPMA in 1970. "At that time, I was a sefore you ever mention it to your hose. That way, you can find an

swer to a question before it en becomes a problem on the nior programmer about to be-come a supervisor," be recalled.
"Initially, I was look-ing for the education

about management that DPMA provided, but S LONG AS YOU HAVE an association that's pliable, that's later on, the network ing part of DPMA mem bership kicked in." To day, Meyer is vice al

in DP, at home or at an annu

in DP, at home or at an annual meeting remains the most popu-lar reason for joining DPMA. "Being a part of the DPMA has been great for me," said Baty, who joined in 1961. "I've learned a lot, I've met a lot of unrection are already bearing fruit at chapter meetings around the country. "At one time, the big guys said that DPMA is made up of people from a lot of small shops, and they backed off," Isa-holls said.

Baty, who was president of his chapter last year and elected regional necretary this year, has his eyes on a national DPMA of-fice. "I'm still climbing the lad-

Klitten

CONTINUED FROM PAGE 107

Habra will will be pared down to support research. The Coscord, Calif., facility will later serve as a resulte networking site for a croft card application.

By Docember, the company is expec-du to have lost 100 employees due to a trition and a voluntary early retirement who fee conventions personnel.

tanama and a vomanasy easy ventrement.

But that is not all. The reorganization means a consolidation of two other data processing sites. According to Kitten the MIS operations from the Chevron Geotelences Co. and the Chevron Oil Field Research Co. are being merged under his corporate MIS entity.

Klitten is still responsible for the strate-gic and tactical impleentation of the plan ron through at

least the next five years. One goal is for the MIS organization to spend the same amount of money as before but to spend it better. The company, which has \$350 million in fixed as-

dence in people and the company. MARTIN KLITTEN CHEVRON

people should un-

derestimate the

detailed planning nec-

essary to instill confi-

sets, has an operating budget of \$240 million for 1988. It will spend some \$75 million on new pursure that data or

sing and networking petitive with the ser-ere. The charter of the services are competi We had too much duplication of effort MIS organization is not to seek a profit

but to maintain an equal balance sheet be-tween costs and revenue. In July, the company was able to refund \$15 million to Chevron's various departments and to rebefore the reorganiza-tion," Klitten says. "The goal of this proj-ect is to consolidate and not have comp forces within the orga-nization. We want to

eve money, but more

Since the MIS con

pany serves everyone within Chevron, Klitter

Chemistra in the Commission of ortant, we want to rate in the future as says, he wants to make

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to the U.S. Department of Commerce to participate in oreign Buyer Program, OI '89 will introduce you to the rho represent the entire world of voice and data commu

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Early planning key to smooth mergers

BY JAMES CONNOLLY

MINNEAPOLIS - Early involvement by MINISCANCIAN PROVINCENT AND RECOVERAGE AND RECOVERA

the American Management Association (ADT The marry of 100 composites that that dendured need negative to expectation to develop the composition of the composition of

lows a merger. He said come

lows a merger. He said communications can overcome such a problem. Deleasey urged senior managers to call on the MIS and human resources groups early in the merger process. He said that major mistakes reported by some of the participants included the failure to draw on the system to acquire detailed information about employee qualifications on the system to he impact of decisions on the work force; and arbitrary decisions mide to eliminate redundant employees and business.

"MIS just wasn't called upon, and if it was called in, it often was too late," De-laney said. "A merger or acquisition 't have to be traumstic and chaotic.

es Address P.O. Res

es during the transition is critical, he ays. "I don't think people should under-stimate the detailed planning necessary o instill confidence in people and the

company."

An employee newsletter focusing on recent moves is in the development stages. An electronic mail system has an open file called Team, designed for employees to contribute solutions and identify problems within the company. The ideas go directly to Klitten for resolution.

Keep morele up
After years in management, Kläten
After years in management, Kläten
reductivity and was direct effect on
reductivity and was direct effect on
reductivity and very leading to the
keys to blanting a morale problem is to
le what you told them you are going to
do Following through is critical."
CTIC has worted to be open with its
clients during the transition. The key now
it to make une the quality of the services
does not deteriorate. Technically, no
downtime should be experienced as agoli-

with a loss of business or loss in worker productivity. You have to ask yourselves, 'What information do we need, and how are we going to communicate with the employees of both the acquirer and the acquiree about what they need and have to offer?'

to otter?"

Delaney, who heads CDC's service bu-reau operation, said supporting such a transition on a consulting basis is one po-tential new field for service departments seeking to recoup revenue that is lost as their traditional batch-oriented business continues to slip.

occlumes to sign.

New jost money: that too namy competes her their doctions show temples employees purely on financial consideration of the sign of t

30% coats not complete such a technical merger.

The greatest problems with incom-pability arose in the area of general led-ger systems, according to 31.2% of the expressed such recording to 31.2% of the problems with accounts problem and receivable were cited by 27.5%, and problems with production and distribution by 17.5%.

The merging of policy by 60.4% of the system the highest priority by 60.4% or 10.0% of the problems of the property of 10.0% of the country of 10.0% of the properties of the country of 10.0% of the properties of the pro-

mos at 31.2%. CDC initiated the research, which was arried out by the AMA. Chief executive fifteers and acquisitions officers at 109 ompanies were surveyed by mailed ques-consaires and personal interviews. The surveyed companies, which anged in size from several hundred to

everal thousand employees, generally rere one or two years into the merge

cations migrate to the two data centers during the weekends. The goal at Chev-ron is to maintain 99.2% availability at the ron is to mair host, he said.

host, he said.

To ensure that service does not drop,
Klitten says, he has made sure that the
most knowledgeable people are stationed
at the helm of lowy projects. "Most people
have been through the major war here—
the Golf recents."

at the helm of key projects. "Most possible have been through the major war here—the Gulf merger." In March 1984, Chevron merged with Gulf Oli Co. in a \$13.3 billion transiction, which represented the largest merger in history. The merger essentially doubled Chevron's old and gas reserves and led up to a major reorganization in the MIS departments of the transition of the Chevron's control of the Chevron's war was a second of the Chevron's control and part recognization in the MIS departments of the Chevron's war was a second of the Chevron's w

Here's how

Lederer, Sethi CONTINUED FROM PAGE 107

etations and guidelines for proective SISP planners:

1. It is difficult to secure top

mentionent for im-

1. It is difficult to secure top management commitment for im-plementing the plan.
MS executives fine in upilit battle con-vincing top management to authorize the plan to the applications that have been identified. The lack of top manage-ment commitment to implementation of the plan suggests that it fields to under-tand its objectives or that it lacks confi-dence in the MS department? a faility to curry the plan. Also, during the time be

tween the study and implementation, anagement's interests can change.
This suggests that prospective SISP
mers should be sure they know top

anagement's desires before expending fort on a plan that may be ignored. Lik-ise, it suggests that MIS planners and agers may want to increase their ef-

managers may want to increase their ef-forts to convince senior management that SISP plans are doable and consistent with management's goals. 2. Implementing the projects and the data architecture identified

z. Impeementing the projects and the data architecture identified in the plan requires further sub-stantial analysis. Many SISP studies do not provide the analysis necessary to start designing and programming the individual applica-tions. Hence, planners should choose an

SISP approach that carries them into the design and programming phases. Some vendors offer such methodologies.

3. The success of the methodology is greatly dependent on the team

leader. The team leader must champion the SISP study by convincing top manage-ment to support it. SISP planaers should choose a respected veteran in the organ action's business. The leader should not be room the MIS department but should be one who is comfortable with modern technology.

te curve who is constructed an indicate technology.

Furthermore, planners should decrease their dependency on this leade through visible top management suppand through a methodology that is defit to simplify the team leader's job.

4. It is difficult to find a team

6. It is difficult to find a team before who must be in critical specified by the methodology. Grant by the methodology. Our control of the control of th

ogy.

6. The planning exercise takes a

6. The planning exercise takes a long time.
Most studies take weeks, or even months. Became business managers often feel that they need results sooner and may lose interest if they don't get them, planners should minimate the duration of the study.
7. The methodology fails to take into account insuce related to plan insulencementation.

implementation.
Although the SISP study may produce an excellent plan, it may offer little to promote implementation. Thus, SISP planners should face the issues that can impede implementation of their plans.

8. It is difficult to convince top

namagement to approve the methology.

Because the SISP study requires or iderable time and effort, and because siderable time and effort, and because many top business executives are unconstrutable with computing, it is difficult to convince them to fund the initial SLSP study. Hence, SLSP planners should provide copent reasons for doing the study and should be ready to present them to top management in simple terms.

9. The strategic information systems plan fails to include an and overall personnel and training plan for the MIS denartment.

services and training plan for to-MIS department.

SISP studies often recommend bring more MIS professionals and providing more database and data communications insing for existing professionals. SISP planners must allocate the time and re-sourced and training needs.

10. It is difficult to find team members who meet the criteria specified by the methodology.

Team members from the user also

specified by the methodology. Team members from the user side need to be at ease with information technology, and team members from the MIS side need to understand the business. Such people with the time to participate may be scarce. Prospective SISP planners should consider the qualifications of their team members carefully. An information technology decomes and the state of th

doing the studies properly and succes by will be critical. Hopefully, the obstacles we found and actions we prescribe will make their tasks

dever and Sethi are business professors at the seph M. Katz Graduate School of Business at the

nit, fairy of Pittsburgh and the School of Man-nt of the State University of New York at Bul

CALENDÁR

OCT 30-NOV 5

sputer Conference and Exposition. New Or-L. Oct. 30-Nov. 2 — Contact: National-American leads Greens Association. 201 Park Washington

presention Industry Association, Annual Con-stem and Exhibition. Washington, D.C., Oct. 30-1.2 — Conact: Information Industry Association, Soliz 1,555 New Jersey Ave., Washington, D.C. 20001.

netional Conference on Computer Commu-les, Tel Airy, Oct. 30-Nov. 4 --- Contact: Charry

OCT. 23-29

obst/XX Users Group Annuel Mooring, New t, Oct. 23-36 — Contact: Lass Joses, Users Group tr. On-Line Suftways, Fort Lee Executive Park, 2 tre Drive, Fort Lee, N.J. 67604.

es, full "\$2 Conferences. Terrento, Oct. 23-27 act: Common Hendquarters, Suite 600, 111 E. Brive, Chicago, \$2,60601. broader BB, Informational Toleron St.

orgy Confurence. San Diego, Oct. 30-Nov. 2 — Contact: R. E. Jurewics, Ground System Consultants, 7006 N.
Ontol Are., Chicago, B. 60631.

tranic Mesonging *88. Reston, Oct. 24-25 — Con-Electronic Mail Association, Suite 300, 1919 Pennsyl-s Ave. N.W., Washington, D.C. 20006. Motwork Users Group ATAT. Medington, D.C., Oct. 24-25 — Centact: Bob Jones, Berinel Power Co., Mail Stop 183, 15740 Study Grove Road, Gathersburg, Md.,

apart Systems Symposium. New York, Oct. 24-26 - Contact: Digital Consulting, & Windoor St., Anderer,

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Conformace on Software Maintenance. Phoenix, Oct. 24-27 — Contact Robert S. Arnold. CSM-88 Control Caur., Saltware Productivity Consortium. 1880 Compus Commons Drive N., Roston, Va. 22091.

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oral Computer Conference and Defense and senses Computer-Graphics Conference, impos, D.C. Oct. 24-28 — Connact: National Council ducation on Information Strateges, P.O. Box 41045, Waccomm Ave., Bethends, Md. 20814.

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Educan '88, Computys for Excellence Educa-tion, Government, Industry. Washington, D.C., Oct. 25-28 — Contact Educan '88, P.O. Box 364, 777 Alexan-for Ecol., Praceton, N.J. 08540.

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DB2/SQL Section. New York, October 26 — Centact: DB2 & SQL/DS Users Bulletin, P.O. But 560 New York.

turage Forum. Sunnysie, Cald., October 26-27 act: Technology Forums, Suite 260, 80 West 78th. obsesses, Mam. 55317.

Deselt Print Quality Seminer. Boston, Oct. 26-28 — Centact. Deselt Information Services, P.O. Box 66, New-tonnillo, Mass. 02160.

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Greenberg, Kenes USA, Suite 903, 271 Madison Ave., New York, N.Y. 10016.

-concel Neurol Network Applications in Signal and Image Processing, Buringame, Call., Oct. 30-or, 1. Contact: Sen Passenti, Alliant Computer Systems rep., One Neurol Drive, Letteron, Mass., 62460

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Unix Expo. New York, Oct. 21-Nev. 2 — Contact: No-tional Expensions Co., 15 W. 39th St., New York, N.Y.

Open Systems Interconnection Conference. Or hade, Pk., Oct. 31-Nov. 2 — Contact: Ommoon, 115 Pari St. S.E., Verms, Vs. 22180.

Conference on Monaging DEC-ISM In-Les Angeles, Nov. 1-2 — Contact. Conner for Concepts, 3 Independence Way, Princeton,

CASE User Conference. Meature, Calif. Nov. 2-4 — Contact: Greg Bosse, Case Research Corp., Suite 210, 155 108th Are. N.E., Bellevaz, Wash. 98004.

Computer Law Institute. New York, Nov. 3-5 — Contact Processing Law Institute, 850 Seventh Ave., New York N.Y. 10028.











Compared to KnowledgeWare CASE tools the others look like toys

Drawing diagrams on a screen sure beats pencils and plastic templates. And if drawing diagrams is all you want, just about any tool will do. But most people want a tool to assure high

quality system specifications and designs. And hundreds of CASE users have "graduated" to KnowledgeWare's intelligent CASE solution, the Information Engineering Workbench" (IEW). Here's why:

Dictionary-based tools can't assure consistency

Most USE tooks are dictionary-based. They store graphic components of diagrams (boxes, lines, arrows, etc.) in one file... and store descriptions separately in a dictionary, two laws to create diagrams, mamusally describe what they mean, mamusally describe what they mean, the mamusally link the descriptions to the diagrams components. If you forget anything, the diagrams get out of spec with the dictionary. And this leads to inconsistent systems specifications and designs.

KnowledgeWare's Encyclopedia guarantees consistency

KnowledgeWare tools interpret the actual meaning behind diagrams (object types, relationships, associations, etc.) and store that information in a single knowledge-based "Encyclopedia." Request a diagram and our expert system draws it from stored knowledge. So it's impossible for diagrams to be inconsistent with the Encyclopedia.

involving: The software products are available from Encoving There axis offices in the U.S. and from Arthur Young Interestional member from master the U.S. Other Art's Enth-A-Streets⁴⁰ Hogic Screen is available at toy

Keeps all diagrams up to date all the time

The specification and design of computer systems requires iterative changes. And each change can impact many diagrams. With most dictionarybased CASE tools you must repeatedly update every affected diagram, because each is an independent octure.

It's much easier with KnowledgeWare CASE tools. Each time you enter or modify information through a diagram, the expert system updates the Encyclopedia. And all diagrams automatically reflect current knowledge.

Enforces the rules of computing

Most CASE tools allow software engineers to specify and design systems that can't be constructed. Their diagrams may have missing inputs, circular relationships, or outputs that go nowhere.

KnowledgeWare's realtime expert system automatically checks and enforces hundreds of logic rules. It calls attention to errors and inconsistencies. And it checks for completeness. All without limiting you to any particular methodology. This automatically assures that specifications and designs can be translated into real systems.

Automatically redraws information in other formats

A dictionary-based tool that stores diagrams as boxes, text, and arrows can reassemble those parts on the screen. But you only get back the same diagram that you put in. Since KnowledgeWare CASE tools store objects and relationships, you can display that information in various ways. For example, use our Analysis Workstation to draw a Data Flow Diagram. The Analysis Workstation can then automatically construct the corresponding Process Decomposition Diagram.

Provides a state-of-the-art user interface Most CASE tools have not kept pace with advances in user interface technology. Some may

arrances in user instance technology. South way even require you to learn different interfaces in different parts of their product. KnowledgeWare workstation tools are mouse-driven with pull-down menus. You can view many diagrams and definitions at the same

time in multiple windows – and in different colors. You can zoom in and out, nest diagrams, mask out distracting elements, and highlight the path of information through a number of diagrams. For more detailed information on KnowledowWarr's Planning Workstion, Analysis Work

For more detailed information on knowledgeWare's Planning Workstation, Analysis Workstation, and Design Workstation, or any of our mainframe CASE tools, call 1-800-338-4130 toll-free (in Georgia, call 404/231-8775).



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INDUSTRY

Charles P. Lecht

Japan telco swipes gold

phone Co. (NTT) has achieved the ti-tle icki ban (Japse for No. 1)

gest company in the world by market value of its shares total number of shares multied by the value per share, cond was IBM and third, Ja-n's Sumitomo Bank.

ressive 21st place in the overall g and third - behind ng and thure — bennish — in terms of high-tech anies, Viewed as a kind of companies. Viewed as a tinist or financial olympics, NTT has won the coveted gold medal, IBM, silver and AT&T, bronze. Morgan Stanley Capital In-

ternational Perspective calculat-ed this ranking of the world's 100 largest publicly traded com-panies so of June 30 by dollar value of all their shares using the exchange rates applicable at

To put things in a computer/communications world perspective, if ranked by the total value of shares, NTT is more than 3½ times the size of IBM (\$276.8 billion vs. \$76.0 billion) and almost 10 times that of AT&T (with a mere \$28.9 billion).
That NTT became the world's most valuable company
Continued on page 122

Olivetti steering for U-turn

BY AMIEL KORNEL

IVERA, Italy — Ing. C. Olivetti. & Co. late last month outlined a sweeping reorganization and shake-up of top manpanement

shake-up of top management aimed at reversing the compa-ny's recent profit slide. The computer and office coujabrant vendor, headquar-tered here, announced is 24% drop in pretax profits to 5122.4 million for the first half of 1986. Last year, the company posted is 29% decline in profits compared with 1986. Revenue during the with 1986. Revenue during the first half of this year rose 16.1%

to \$2.59 billion. Company officials, noneth less, expressed optimism about financial performance during the second half of the year, saying sales would grow as clients be-gan buying recently released



April from his position as presi-dent of AT&T's Data Systems Division by Chairman Carlo de Benedetti. Cassoni left Olivetti

to join AT&T in 1986 with the understanding that he might eventually return to the firm. Under the restructuring plan, which will take effect Jan. 1, 1989, Olivetti will set up three

1989, Olivetti will set up times separate companies dedicated to specific product areas. Each will be responsible for all operations in its area — from product de-sign to production and sales. All three will be controlled and coor-dinated by de Benedetti and Cas-

The first, called Olivetti Systems and Networks, will regrou most of the firm's profession computer and communications activities, including minicomput-ers, personal computers, local-area networks, terminals, work-

Yocam bids farewell to Apple

time Apple Computer, Inc. exec-utive Delbert Yocam will walk

Yocam was unavailable for comment, but an Apple spokes-man emphasized that his depar-

ture is decision.
"Del is 45 years old; November will be his 10-year anniversary," the apokeenan said. "He Continued on page 118

Data View Money where your mouth is Average 1988 marketing budgets for hardware, software as communications products vendors



A fresh face in Prime spot

BY NELL MARGOLIS

NATICK, Mass. — Hot off a five-year stint in which, accord-ing to industry analysts, be reing to industry analysts, be re-versed the foundering fortunes of General Electric Co.'s GE In-formation Services division, An-thony L. Craig can be called a turnaround artist. Early this th, as the surprise news ad of Craig's imminent as-

apread of Craig's imminent as-cendency to the chief execu-tive's office at Prime Computer, Inc., many called him just that. Craig, however, indicated that the better label would be "ready for prime-time player." While be describes bisuself as

and "associous of excessive static," Craig said that he ar-rived at Prime with great excitement but no specific game plan "My immediate role," he said

The 43-year-old Craig — Continued on page 123

Sun shines on Cypress Semiconductor. Page 117.
 DCA plans purchase of T1/T3 link developer. Page

Industry weighs environmental costs

BY J. A. SAVAGE

emputer companies and semi-inductor manufacturers made a effort to understand the costs and benefits of being a good and nenetits of being a good neighbor at the computer indus-try's first environmental confer-ence, held early this month. Silicon Valley was chosen to host this meeting, since the semiconductor industry there

the focal point of the computer

going to decide how competitive you are in the long run. It's a

Corp. Greene said DEC made a decision in the early 1970s to use a water- and detergent-based cleaning system for its circuit boards, instead of the industry-standard — and inherently

firm was growing rapidly and dis-posal costs for the dirty dishwa-

advection of toxic wastes are in ore of a bind. In seeking to re-ain competitive, they cannot use their prices to cover envi-

Computer companies are not only facing replacement of sol-vents used to clean circuitry but are large users of chloroflourought to deplete the Earth

onne layer.

The director of environmental and occupational health for the American Electronics Association, Cheryl Russell, warned

not just a reaction to regulation, but "a sound business thing to do," Romsell said.

DEC has created a task force to find ways to replace CPCs. Greene said that so far, the com-pany has reduced its use by 50% simply by limiting waste and be-ing careful about covering the holding tasks to keep the chemi-cal from wearering.

vironmental regulation, ats still wanted more b nonours still wanted more but ness involvement and lobbyit and, thus, looser regulations.

California Assemblywom Delaine Eastin (D-Southern Ameda County) warned that



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Cypress profit defies the industry odds

BY NELL MARGOLIS

SAN JOSE, Calif. - Newly public Cy-press Semiconductor Corp. last week announced strong profits and revenue growth, illustrating the relative health of ory chip niche in the computer

Fueled by the personal computer ma ket's discovery of the benefits of cache memory, which uses the static random-access memory chips Cypress provides, the chip and microprocessor manufactur-er last week reported \$36.9 million in revenue for the third quarter ended Sept. 26 — a 76.6% increase over third-quar-ter revenue for fiscal 1987.

Net income for the company came in at \$5.5 million, a 71.9% rise from earnings in last year's comparable period as well as a 17% increase over second-quarter prof-its of \$4.7 million.

What trends? Cypress' upbeat numbers, as well as the expectation that the climb will continue, are bucking several industry trends, ac-

cording to analysts. The PC market, so recently a seemingly limitless boomtown, has slowed. And earlier this month, the

traditionally optimistic Semiconductor In-dustry Association forecast s 3% indus-trywide decline by 1990. The market, however, is ripe for Cy-ess, said Millard Phelps, an analyst at ambrecht & Quist, Inc. in San Francis-

"High-performance static RAM chips are in great demand, because high-end personal computers are using them to feed cache memory," Phelps said.

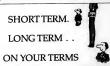
Waking up to cache
Cache memory, he explained, was, until
recently, largely ignored by the PC universe. The superspeed performance that
high-end processors such as Intel Corp.'s
80386 make possible, however, has sensitized manufacturers to the need for

ick-acting cache memory — a need at worked to Cypress' benefit in its and quarter and is expected to continue unru quarter and is expected to continue propelling the company forward.

"They're at about 2½ times (semicon-ductor) industry growth right now and growing." Phelps said. "They resilly do expecte well."

execute well."

During the last quarter, Cypress and
its subsidiaries introduced 10 products.
The venture-backed company, which has
just recently gone public, also took home
the Stanford Business School Alumni Association's Encore award as the entrepre-neurial company of the year, following in the footsteps of Apple Computer, Inc. and Sun Microsystems, Inc., among others.



at type of high tech equipment financing are n, long term, in between? 30 day defivery, 6 i se? COS will consult with you and then advis nt deal is best. Whatever your needs, we hav

see we've been in this business internationally for 15 years. COS' ad access allows us to offer you the newest installations or the best second r sourcing available.

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COSAG

DCA makes pitch for T3 firm

ALPHARETTA, Gs. — Digital Communications Associates, Inc. (DCA) recently signed a letter of intest to pay approximately \$14 million in cash and DCA common stock for Digital Transmission Systems, Inc. (DTS), a developer of the T1/T3 link.

The purchase will enable DCA to at-tack the public network market sector.

If the buyout agreement is approved,
DTS will become a wholly-owned subsid-iary of DCA. The deal is expected to close

inry of DCA. The deal is expected to such this 90 days.

DCA already has an entry in the T1 market, the System 9000, which was developed by Cohesive Networks Corp. DCA purchased Cohesive Networks in the fall of 1986. The System 9000, which consists of wide-area voice, data and wideo networking products, is sold to large corrections healthing private networks.

rations building private networks.

DTS products target the telephor es and long-distance carriers The company has a cross-connect product under development that is aimed at public networks and will link T1 and T3 sysIf the merger is successful, DTS will ecome part of DCA's Network Commu-cations Group and the T1/T3 link will be cations Group and the T1/T3 link will be old by both DTS and the System 9000 sless forces, but to different audiences, he

Initial joint development efforts will in-blive incorporation of the DTS network innagement system into DCA's Open letwork Management System, providing entral control of both product lines, said ICA Cheirman Paril Moure.

DCA Chairman Bertii Nordin. Separately, DCA cited scasor elegations in several product lin slowdowns in several product lines as a reason for an earnings decline to \$7.1 mil-lion for its first quarter ended Sept. 30— s 21% decline from the same period a year

ago.
First-quarter revenue totaled \$51.7 million, up 3% from revenue of \$50.2 million in but year 5 comparable quarter.
A storedown in sakes of DCA's personal compater-estated products typically occurs in the summer. But the firm said that in fixed 1897 and 1898, the summer shamp was negated became customers postsponed purchases to evaluate new PC product entries from IBM.

TO MOST PROGRAMMERS. WORD.

Everyone knows that software testing isn't a job that inspires kind words. In fact, even the most patient programmers and users have been known to spout strings of

grautiness are users nave been known to spout strings of expletives when finding endiest stering tedium; with now you can clean up your act (and your besting) with TRAPS. The PC based Posting/Recording And Playback System that increases test productivity by up to 900%. TRAPS decess and highlights software defects in any on-line environment. Even the smallest errors are identified and viabulated. Indeed the intermediate in any on-line environment.

fied and isolated-before they go into production.

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automated testing tool, call TRAVIECH us at (203) 277-9595.

Banyan spills two-year plan

After silence, firm emphasizes Unix, multivendor support

BY PATRICIA KEEFE

BOSTON -- Breaking months of silence BUSTUN — Breating monutes or saence on its long-term strategic directions, Ban-yan Systems, Inc. recently detailed a two-year plan of action that underscores both its commitment to Unix-based servers and a willingness to support other envi-

Chief Executive Officer and com niter David Mahoney said he expects privately held firm to attain an annualprivately held firm to attain an annual-of eveneer me rate of more than flow of eveneer me rate of more than flow lifton meat year. A two-year, 12-point intime focused on large outports citative focused on large outports e-cria with the mean flow of the company of the rar, he added. Baryan has been hinting at a public of-ing for several years now and is consid-d by many industry analysts to be a me candidate for acquisition.

yel to Vines.

Westboro, Mass.-based network tware vendor said it has no intention of andoning its. Unix-based Virtual stronking Software Vines) network cerating system and also reiterated superating system and salso reiterated superating systems and salso reiterated superating systems.

Person has already executed an agree-ent with minicomputer maker Wang aboratories, Inc. under which it will supply core networking technology. Other such pacts will follow in the near future, the vendor said. One rumored arranget involves a yet-to-be released Data meral Corp. server.

Yocam

CONTINUED FROM PAGE 115

wanted to have time to do other things."
Most recently, Yocan was president of Apple Education and Apple Pacific, two operating divisions created during a recent reor ganisation. He began at Apple as vice-president of manufacturing in 1979 and ascended to chief operating officer, a post he held until the summer.

Some industry observers saw Yocam's Some industry observers saw Yocam's move from COO to president of the edu-cation and Pacific Rim marketing groups as a demotion. However, Yocam insisted that he was pleased with his new assign-ment because it allowed him to pursue his passion for education.

asion for education.

In a prepared statement, Apple Chairin and Chief Executive Officer John
ulley lauded Yocam'a achievements,
iling him "one of the industry's finest
ecutives, with his commitment to operinterest excellence, possion for prepared. executives, with his commitment to oper-ations excellence, passion for personal computer technology and embodiment of Apple's business and cultural values." Apple Education — created as a sepa-rate operating division nearly two months ago — has been folded into Apple USA under President Allan Z. Loren as part of

under President Allan Z. Loren as part of the latest restricturing of the company. In addition, Loren has created the Apple USA marketing group, which will include education and business. David Hancock, previously vice-president of Apple Pacif-ic, will head that group under the title se-nior vice-president of marketing.

Some analysts are skeptical about the Wang deal, suggesting Banyan has little to gain by it. However, the networking con-cern's growth plans have been hobbled by its relatively small size and, consequen-

tially, support and marketing limitations. Successful alliances with larger sys-tems vendors could help expand Banyan's estalled base and beef up its support capabilities, a key prerequisite to attracting corporate accounts. These alliances could become especially critical in the next few

years, given the following trends: Leading players in the work-group LAN

are moving - typically Unix-based — are

via convers to network • Users are de

It is still unclear whether Banyan will license Microsoft Corp.'a OS/2 LAN Manager, but OS/2 support is slated for next year and reportedly will include supment year and reportedly will include sup-port for applications written to LAN Man-ager. Rivals 3Com Corp. and Novell, Inc. will ship OS/2 client support this year. Banyan currently supports Apple Computer, Inc.'s Macintosh via a marketompace, me a water to a division of some Microsystems, Inc. However, more lirect Mac support will be available in 1989. Also planned is increased support direct Ma. 1989. Also planneu ... orkstations.

By 1990, users can expect further en-ancement of Banyan's distributed sys-ens software support, directory ser-

"Tsaid, What if I cou computers in your compan really inexpensively. He was so intrigued I was embarrassed to tell him how simple it was."

-Allen Rehert, AT&T Director of Data Networking

MERGERS & ACQUISITIONS

Electronic Data Systems Corp. sa-nounced that it has acquired General Data Systems, Inc. (GDS), a privately held Philadelphia-based company special-izing in systems and services for the property and casualty insurance industry. GDS' products provide an advanced techpical platform for three insurance an-

Los Angeles-based Coast Savings and Loan announced it has completed the \$35 million sale of Data Line Service Co., its wholy owned data processing business. The purchaser is Data Line Holdinate Inc. formeth Dancer Counldings, Inc., formerly Denver Group

Holdings, Inc. Other terms of the sale re not disclosed. Data Line Service is a Were not discussed. Data Line Service in 22-year-old company with headquarters in Covins, Calif. It provides data processing services to approximately 115 financial institutions having combined assets of \$50 billion throughout California, Arizona

Sungard Data Systems, Inc. and Di-naster Control, Inc. (DCI) announced an agreement in principle for Sungard to acquire DCI. The planned transaction is scheduled to be completed by Nov. 30. DCI is the largest disaster recovery company for users of Unisys Corp.'s Bur-

roughs mainframe computers. Formed in 1979. DCI provides hot- and cold-site backup facilities and disaster recovery consulting to customers throughout the U.S. DCI is based in Warminster, Pa.

Case Communications, Inc., a subsidiary of UK company Case Group, has merged with Datatel, Inc.
Both companies had been acquired by the British companies had been acquired by the British company Dewry Group PLC
— Datate in October 1967 and Case last month. The combined operations will be based in two locations, Cherry Hill, N.J., and Columbia, Md.

Decision Industries Corp. and that it has completed its refinance merger with Momentum To

ogies, Inc. 10t ourman Technologie Industries and Momentum Technologie have been combined and will operate un Merisjon Date

Inc. (DDI).

DDI remains a wholly owned subiary of Onset Corp., which is privatheld primarily by the venture capital for of J. H. Whitney & Co. and Welsh, Cars Anderson & Stowe.

Systems, Inc. (AMS), a processors services company founded in 1970 and headquartered in Charlotte, N.C. CTG, a \$200 million international consulting, systems integration and professional ser-vices firm with offices in each of those cit-ies, expects to substantially increase sales.

The AMS offices will comb CTG's North and South Carolina offices. The expanded Carolina district will em-ploy 700 professional software engineers under James VanGelder, CTG's South-

has been reached whereby PMSC will purchase crutian sents and operations of the Business Information Services Driving the Committee of the Committee of the price of approximately 45 million. The agreement pertains to informa-tion services primarily for the properties and causally insurance markets and de-out include information services that Hooper Holmas mother and to the direct-mand marketing industry.

Greystone Technology Corp. has been acquired by National Computer Systems Co. (NCS) in Minneapolis. y-neems to, (NCS) in Minneapolis, reputone's primary product is GTM, a gh-performance. Digital Equipment orp. VAXVMS-compatible implemen-tion of the ANSI-standard MUMPS rogiamming language and data manage-ent system. Greystone will operate as a should owned subsidiary of NCS.

The Orange County, Calif., office of Tou-che Ross & Co. — the Big Eight zo-counting and consulting firm — and Ir-vine, Calf.-based Dyhestra Consul-tants, an information systems man-agement consulting firm, announced that their firms have merged. Dykstra Consul-tants has moved its offices to Touche Ross' headquarters.









ld connect all the

on PCs to make his business run better, and yet when they wanted to share information, they had to pass it along. Literally,

No compatibility.

He had local- and wide area networks, he had satellites, he had mainframe host environments and he had incompatible PCs spread all over the place. He needed to link them up uniformly for document trans I told him AT&T could help him share information betw

incompatible systems, an extension of our commitment to OSI. He could link IBMs to Apples, Wangs to ATRTs, DECs to HPs...* whatever he had. Quickly, easily and inexpensively I said he could do it with AT&T Mail. Hest he was astonished (that's the

usual reaction), then he was impressed.

I said he could share spreadsheets, word processed documents, anything. And, with AT&T Mail software, whenever infor mation is received, a message indicator appears on the screen,

IN BRIEF

any expects to ram using hardware systems on oil by 1989.

Going for the stars

ultimilion-dollar order signed er this month makes IBM the earner this month makes 15th the on-line transaction processing sys-tems supplier for Galileo, a con-sortium of 10 European airlines in-cluding Aer Lingus, Alitalia Airlines and British Airways. The contract e of the largest garnered by — one of the largest garnered by IBM's European operations to date — covers workstations and will place 15 IBM processors in the Swindon, UK-based Galileo Data Centre. The Galileo contract is timilar to a deal struck by IBM last year with a four-sirine European con-portium called Amadeus.

Going for the gold

Sacramento, Calif.-based applica tion development software make Unify Corp.'s coffers swelled by Unity Corp.'s coffers swelled by \$6.5 million this month, courtesy of a consortium of new and already ex-isting venture capitalist investors. Unity CED David Saykally declared the new round of venture financing a salute to the company's Accel fourth-generation application de-velopment inguage, sales of which have set Unity revenue and profits a read-live second of the company of the com-pany of the company of the company of the com-tended of the company of the company of the com-tended of the com-ten

Olivetti

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Luigi Mercurio, a former Olivetti execu-tive who founded U.S. telecommunica-tions equipment maker David Systems, Inc. The second company, Olivetti Infor-mation Services, will offer software, value-added network services, voice/data services, facilities management, education and training and electronic publish-ing. It will be headed by Olivetti's Franco

Olivetti Office, the third company, will concentrate on office equipment such as calculators, typewriters and text processors. Franco Tato, currently heading up Triumph Adler AG, Olivetti'a West Ger-

man subsidiary, will lead the office group.
Notable for their absence from the se-nior management lineup are Vittoric Levi, vice-president of operations and El-serino Piol, vice-president of strategy. Whether they will be staying with the company is unclear.

What about our relationship? Another question posed but not answered by the reorganization is what impact it will have on Olivetti's relationship with

AT&T. s have had an often The two companies have had an often-troubled relationship since they became strategic partners in 1983. The U.S. gi-ant owns a 22% share of Olivetti, and the The tun or two companies have cross-marketing agreements under which AT&T markets

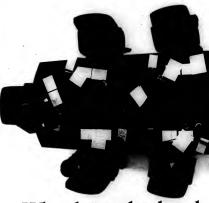
Olivetti PCs in the U.S. and Olivetti sells

Olivetti PCs in the U.S. and Ouvert sein AT&T minicomputers and private branch exchanges in Europe. Olivetti is said to be unhappy with de-clining purchases of its PCs by AT&T. Earlier this year, the Italian firm Isunched Earlier this year, the Italian firm launched a line of minicomputers, the LSX series, that cast doubt over its commitment to pushing AT&T'a 3B family. In April, Carlo de Benedetti rebuffed

AT&T overtures concerning an increase in its capital share and management con-trol in Olivetti. In May, Olivetti officials

trol in Olivetti. In May, Olivetti oriccias acknowledged that the allies were reas-sessing their relationship.

Friction between the firms has been exacerbated by differences in manage-ment style and downward pressure on the follar/first exchange rate, insiders said.



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EXECUTIVE CORNER

Network Equipment Technologies, Inc. (NET) has appointed Frederick E. Glave, 48, to the new position of senior vice-president and general manager of

the private networks division.

Glave, who is a 25-year veteran of Northern Telecom, Inc. and Bell-Northern Research Ltd., will assume general management responsibility for the operaons of all four of NET's product divi-

NET also announced the appointment of Roger T. Hobbs, 45, as senior vice-president and general manager of the na-

served as general manager of the division for the past four years and built the cur-rent sales organization, was named vice-president of marketing.

Comdisco Disaster Recovery Services Inc. has named John A. Jackson execu-tive vice-president. He was previously se-nior vice-president for operations at Com-

The board of directors of Alpha Microsys tems has elected John S. Cain presider

President Robert B. Hitchcock will continue as chairman of the board and chief executive officer.

Storage Technology Corp. announthat A. Donald Stratton has join unit A. Donald Stratton has joined Storage Tek as vice-president of corpo-rate quality. Stratton will head the corpo-rate quality group, which is part of the Storage Tek customer satisfaction func-

Drior to joining Storage Tek, Stratton was a quality expert during a 30-year ca-reer with AT&T, where he managed vari-ous quality activities relating to engineer-ing and installation.

Cain will continue as chief operating of-ficer and chief financial officer. Former the appointment of Donald E. Lemon.

former president and CEO of Alcatel In-formation Systems, as president and CEO of Decision Data Computer Corp.

System Industries, Inc. recently ap ed Donald C. Dickson to assume t sition of vice-president of field eng

Dickson was most recently Sy dustries' vice-president of sales opera-tions. He was founder and president of Focused Training Systems, Inc.

Archive Corp. has appointed George II Rea to the position of vice-president a

Rea came to Archive in June to provide interim management services as acting general manager for the data storage division when M. Thomas Makmann resigned

Bruce Elmblad has teamed up with Bachman Information Systems, Inc. to di-rect the company's international efforts to organize a distribution network in Western Europe and a subsidiary in the

Jon Bachman, director of interna-nal sales and support, will be directing e company's sales and support opera-

tions. Elmblad was a founder of Prime Com-puter, Inc., a cofounder of Inforex, Inc., a manufacturer of computer peripheral equipment; and director and chairman of Telxon Corp., a manufacturer of portable

Modular Computer Systems, Inc. an-nounced the appointment of Guy Rabbat as president and chief executive officer of the company. Rabbat was formerly vice-president of research and development at Modular Computer.

MAD Intelligent Systems, Inc. has announced the appointment of William J. Griffin to the poet of senior vice-president of finance and cheef financial officer. Griffin poins MAD from IBM, where he served as corporate director of financing at IBM's Armonk, N.Y., headquarters.

Institutional Communications Co. an-nounced the appointment of Gordon "Don" Hutchina Jr. to the position of president and chief executive officer of the communication.

the company.

Prior to joining Institutional Communi-cations, Hutchins was senior vice-presi-dent of sales and marketing at Williams Telecommunications Group, based in St.



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of control for your network, with integrated network management that's compatible with emerging OSI standards. 8098Codex Corporation. Monority and to are endowades of Mouratin, Inc. Codes to a represent redomark of Codex Corporation. Sale In Entropy and IL-2 660 0000. in Canada 46-793-3000, in the For East 50-5 666700 in Jupan 64-5 566870 in the American 617-564-2000.

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simply and smoothly, then you can concentrate on putting some distance between you

and your competition. The Networking Experts



Lecht FROM PAGE 115

despite the fact that its home marketplace is no larger than Montana and its population is half that of the U.S. is a phenom-enon. NTT reached this height based on 1987 sales of \$46.6 biln and profits of \$2.4 billion,

Line and quelles of \$2.4 billion. reflecting a 6% and \$50% in-crease, respectively, over the previous fixed year. In comparison, IBM's asles were \$5.4.2 billion, only 6% and 10%, respectively, AT &T is asles were \$3.5.6 billion, on 6% and profess \$2.0 billion, on 6% and profess \$2.0 billion, only 4% are up. With profess are the major entire state of the case in 15-pan. In the two years following in 1985 directively by the Japo

pan. In the two years following its 1985 divestiture by the Japa ness government, NTT's shares skyrocketed for reasons that had little to do with profits. Even with the impressive in-crases in NTT's profits from 1986 to 1987, these, it viewed as a percentage of sales, were less than half those of IBM's.

Private, public offeringa A total of 1.9 million shares were initially offered only to NTT employees at roughly \$5,000 each shortly after the company's divestiture by the Japanese government in 1985. A second offering of the same number of shares to the Japa-ness public—foreigners were number of shares to the Japa-nese poblic—foreigners were excluded—was held at approxi-mately \$20,000 per share. In the first week of this month, NTT held a third offering of 1.5 million of its shares to anyone who could cough up the cash— roughly \$17,000 each. Some brokers, the Japanese government and NTT execu-tives are bemoaning the fact

government and N I I execu-tives are bemoaning the fact that shares have slipped in value from their high of approximate-ly \$20,000 each, but how they know what the price should be remains a mystery to me. Be-cause NTT's victory in the race for world financial supremacy by value of its shares cannot imvalue of its shares cannot im-mediately be traced to profits, one might be tempted to con-clude that the Japanese govern-ment — its former sole owner — had been giving it a massive dose of financial steroids. That NTT's stock perfor-

mance was achieved during a pe-riod in which competition in nications was introduced in Japan lets us know just about how much the Japanese public expects the newly competing companies to erode NTT's busi ness. Like the newly competing U.S. companies vis-a-vis AT&T they can do little but resell the prevailing communications con pany's facilities after buying them at wholesale prices. While this explains the lack-luster increase in sales at NTT

and the decline in AT&T's case, it also explains the whop-ping double-digit (40% plus) in-creases in profits for both comies. It is instructional to on the extreme case, in which a communications-cum-

computer company, which owns just about all the communica-tions facilities in a country, gradually changes its business from serving the general public to do-

ing little more than selling to a few wholesalers. Sales volume plunges indeed but not as fast as operating expenses — there are far fewer clients to deal with, no marketing require-ments, less end-user mainte-

nance — and profits soar. In the next financial hightech olympics, we need not won-der too much how today's top three will rank. Since none of the

three really competes with the others and there is no other con pany in their class, their positions as the top three high-tech firms seem fairly secure.

Of course, should the long-awaited ISDN day arrive when

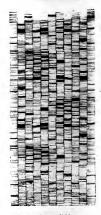
the powers that today's com-puters provide can be offered over telephone lines, the situa tion could change. With ISDN

between IBM and its two top

between IBM and its two top-ranking nonrivals to occur. But until then, it a my gues that only a change in dollar/ye exchange rates will unseat NTT from its gold medal posi-tion as ich ben largest in our high-tech world — and in any other as well.

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Theirs.



The second most reliable impact printer did this much before it stopped. It wound up in the repair shop after 7,000 hours or ten months of printing.

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Fresh face

FROM PAGE 115 tho will begin his stint as CEO of Prime when current CEO Joe M. Henson steps down "several months from now," according to a company spokesman — spent his first week as Prime's new chief operating officer, execu-tive vice-president and board member meeting with employ-ees and carrying out his self-

The man is incredibly asboth technologically and tetwise," said David Taylor, director of consulting at the Gartner Group, Inc., a market

Talking to industry observers about Craig's stewardship of GE Information Services, Taylor said, "you get two reactions: One is that be did a very good job

One is that be did a very good job of directing the division, of pro-viding a vision of where GEIS should be and how to get there." The other, be said, is that Craig was never wholly success-ful in communicating his value-added network-based vision to

GE top managers. "If you can't sell your idea to

management, no matter how technologically good it is, you're vulnerable," said Taylor, who said he sees Craig as an admira-bly equipped leader whose mis-sion at GE Information Services

was aborted.
At Prime, Tsylor noted, Craig himself will be top management, umably emp There is a question on many

minds as Craig approaches his turn at the helm of one of the mojor companies attempting to navigate through the increasing-ly perilous minicomputer mar-ket: Will that course be one of aton on the computer-ai

sign and manufacturing (CAD/CAM) market?
Guided, be said, by factors of law, business practice and simple prematurity, Craig declined to comment at this time.

However, the CEO-elect

HE MAN is in-· credibly astute, both technologically and mar-ketwise."

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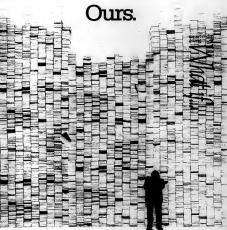
conceded that it would not be out of line to assume that "becoming very expert in vertical acquisi-tions" is part of his carriculum as be educates himself in the ways, means and needs of his new com-

Major step Prime took another major step in that direction last week with its agreement to buy GE's Calma CAD/CAM business.

With the compute and particularly the m er sector, in a well-catal er sector, in a well-cataloged state of turmoil, "a company needs a leader who is sensitive to market shafts — who, hopefully, can see them coming before they happen but who can at least rehappen but who can at least re-card decisively once they do," said Kathryn Korostoff, an analyst at Framingsham, Mass, -based mar-let research firm International Data Corp. "I think Tony Craig is that kind of man." Craig, Korostoff said, "is the take-action, hands-on kind of person who will revealuate Prime's strategic direction if be

Prime's strategic direction if lie hinks it's needed — who will make decisions and follow them





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DEC pros still hard to come by

But more employers seek application experience with technical versatility

not necessarily mean a job in a

now use

VAX shops make use of several languages. In addition to Cobol, languages. In addition to Cobol, Fortran and C, they are begin-ming to rely on fourth-generation languages such as Oracle Corp. is Oracle and Relational Technol-ogy, Inc. a lagres. Employers generally require programmers to be proficient in one or two of these languages.

ner, president of American Data Search and Management Con-sultants in New York, 45% of the

searches his organisation has been asked to conduct this year have been for professionals with DEC experience, up from 10% a cade ago. At that time, virtual e of the positions involved ess applications; now alet all the prospective employers are banks and brokerage

VAX experience with the VMS operating system and a combination of several languages, includ-ing Cobol, Basic, Fortran and C,"

Wanted: DEC developers But clients of the firm know that DEC developers are so hard to

find that they overlook otherrequirements. twoical "Managers tell us not to even worry about the applications background of the candidate be-cause they know there may not be a competitor with a parallel DEC environment." Waldner

But Schwartz says the rapidly growing ranks of banks and bro-kerage houses that have in-stalled VAXs are getting more selective. "A couple of years ago, they were dying for VAX people, so they took them from any environment, including very

chwartz says

Now they still hire e row they still hire engineer-ing types, but more often the employers ask for people who have some financially related background." Schwartz adds. That qualification is particularly important for necess matter. important for people working with meers to de

> ORE AND more companies of different types are acquiring VAX equipment, and consequently the job options are much greater than in the past.

IACK SCHWARTZ SOURCE EDP

Salary ranges for technicians with DEC experience can be large. For example, a DEC pro-grammer/analyst with three to grammer/analyst with three to five years of experience may earn between \$30,000 and \$60,000 a year. "If the person comes in with DEC hardware/ software background and also the knowledge of the business application, he can parky that

Little of this, little of that DEC professionals might find themselves undertaking a rela-tively broad variety of tasks.

"Many of the DEC business en-vironments I've seen have been similar in that the employees did similar is that the employees die a little of everything." say die Welborne, director of informa-tion resources at Crowe, Chizek and Co., a South Bend, Ind., ac-counting firm that has been de-veloping Cobol business applica-tions on DEC equipment for more than 12 years. In Welborne's shop, techni-

The corporate profile Professionals interested in iden-tifying companies that use DEC equipment for business develop-ment, or that may eventually do so, might look for a specific corcians do programming as well as analysis. "You might even sit at the Help desk once a week just to remember what it's like to talk porate profile.
"DEC has taken the approach
that rather than take IBM head-

on, they are going to focus on ar-eas in which they are strong, and this certainly includes providing ness systems to comp with heavy networking require-ments," says Prabhat Andleigh, vice-president of technology at Lobb Systems, Inc., a Wakefield, sed systems integra

VAX installations, Schwartz

"More and more compar

of different types are acquiring VAX equipment, and conse-

quently the job options are much

in the past.

tion firm.

DEC can provide a company with a very small system and then cluster it later for very heavy distributive processing, he says, so any company with regional offices and networking rerements may be a likely can-ste for DEC equipment.

"Where there are decentral-ized operations and decentral-ized decision-making, the com-pany needs a system that can in common across the ard and provide growth,

Andleigh says.

th people," he adds.

This practice can be a boon
This practice can be a boon
project, says that Livingston, a
project, says Hank Livingston, a
systems manager at Champion
International in Courtland, Als.,

International in Courtism, Alls., where several business applica-tions are running on VAXs. "Those people know more about a project. They don't just have one piece of the puzzle to work on; they've got the whole puzzie," he says. In addition to this variety of tasks, DEC professionals are

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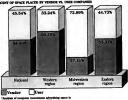
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MARKETPLACE

Be cautious with used DECs

Though bargains abound, ensuring maintenance must be top priority

BY DAVID GABEL

Suyers about to venture into the secondary market for computers and peripherals from Digital Equipment Corp. should be aware of two salient points: The first is that there are bargains to be had. The second is that one ue usu. I ne secono is that one should be particularly cautious in the relatively freewheeling DEC secondary market. Buyers should be careful to ensure that maintenance is available and that provisions for it are spelled

out in purchase agreements. out in purchase agreements.

"Prioes can run anywhere
from 15% off list to 75% off list,
depending on the piece of equipment," says Dennis Lynch, owner of Merida Trading Group, a
dealer of used DEC equipment in
Woburn, Mass.

A used DEC Microwax II, in-

A used DEC MICROVAX II, In-troduced in 1985, is expected to carry a 5st price half that of a new system by January 1989 and 15% of it by 1990, Lynch says. Other systems are expected to be subject to the same sort of price decline.

The relatively weak demand

stems partly from DEC's frantic pace of technological innovation New technology quickly leaves the old obsolete, so the older equipment rapidly falls in price. The user not needing leads edge products can save a bund

Stuy in tune But in taking advantage of be

gains, cautious users would do well to inform themselves about the market and its operators. The expertise of dealers and their support capabilities vary

Maintenance is important in this market as in any other. One option is to contract with DEC itopuon is to contract with DEC it-self. "We provide service on any equipment we build, new or used, if it is in a serviceable envi-ronment," a DEC spokesman says. DEC, like IBM, requires

says. DEC, like IBM, requires
the equipment to meet certain
standards. The company will inspect equipment and bring it up
to the specifications if necessary.
Again like IBM, if DEC removes a piece of its equipment
that it has maintained and reinstalls it within 90 days, the com-

pany will charge a one-month service fee for the removal, a two-month fee for the reinstalla-

wever, dealers of used equipment say DEC mainte-nance is provided by autonomous district service centers that operate as profit centers,

range, and when such a glitch happens, it's always resolved over the phone in a short time." Fagley advises buyers of used Fagley advises buyers of used equipment to make sure that the dealer guarantees that the equipment is acceptable for maintenance. "The buyer should insist that the dealer delivers the certificate of maintainability to

oblem at the end-user level." Bob Fagley, DEC's group

ger for corporate accou service, says such glitch

occur only once or twice a month. "It's in the 1% to 2%

HE BUYER should insist that the dealer delivers the certificate of maintainability to him upon purchase."

> **BOB FAGLEY** DEC

and that policies may not be con-sistently implemented. A district manager, for example, may not want to certify a piece of equip-

ment for manneance.
"The corporation may sup-port its policies," says C.D. Smith, owner of Houston dealer. C.D. Smith and Associates, Inc. and president of the Digital Deal-ers Association (DDA), "but of-ten there is a four- or five-day

him upon purchase," he says.
The DDA seeks to establish an orderly market for used DEC equipment to boost volume and pump up resale values. That strategy meets with approval from DEC. "We believe that ease of movement of our products increases their value in the aftermarket," Fagley says.
One characteristic of an or-

One characteristic of an or-derly market is reliability on the

part of dealers. Smith says there are 200 to 300 dealers in the market, and their maintenance services range from bringing in DEC to providing maintenance themselves to selling with no

Secondary pitfulis
The experience of Don Roach,
operations manager at Brouer &
Co., a Booton software developer, illustrates some of the pitfalis
of the used DEC market and the
value of a vendor that will deal

DEC VAX-11/730 and discovboot. DEC sent over two mainte-nance workers, including a disk specialist, who spent several days working on the problem without success. Finally, the dealer stranged for one-day de-livery of a new drive.

onnel could not get running. Af-er a day, the DEC crew found a ter a cay, the 1922 crew found a bad memory-controller board, which the dealer replaced in less than an hour, again without charge. Such rapid dealer re-sponse obviously pleased Roach.

mer data center manager based in Ne

The BoCoEx index on used computers Claring prices report for the usek ending Oct. 7, 1988

	Clouing price	Recent	Recent
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XT Model 086	\$1,100	\$1,250	\$900
XT Model 089	\$1,300	\$1,575	\$1,050
AT Model 099	\$2,200	\$2,400	\$1,700
AT Medel 239	\$2,600	\$2,900	\$2,300
AT Model 339	\$3,000	\$3,650	\$2,500
PS/2 Model 30	\$1,550	\$1,700	\$1,300
PS/2 Model 50	\$2,350	\$2,500	\$1,900
Compaq Portable I	\$775	\$975	\$650
Portable II	\$1,850	\$2,000	\$1,650
Pertable III	\$2,900	\$3,550	\$2,575
Portable 286	\$2,075	82,400	\$1,675
Pice	\$1,125	\$1,250	\$800
Deskpro 20-MHz	\$1,025	\$1,450	\$975
Dookpro 286	\$2,575	\$3,150	\$2,000
Deskpro 386	\$4,600	\$5,100	\$4,100
Apple Macintosh 512	\$700	\$900	\$550
512E	\$775	\$925	- \$600
Plus	\$1,100	\$1,325	\$950
Plus 20-MHz	\$1,425	\$1,450	\$1,300
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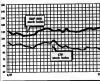
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Dec. 19	IBM-Compatible PCs/PS2 Market Products/Monitors	Dec. 2

STOCK TRADING INDEX



Last Week	This Wes
98.8	97.3
95.7	93.6
102.3	100.5
56.2	56.5
79.8	77.8
120.2	116.3
85.5	83.5
114.4	115.3
	98.8 95.7 102.3 56.2 79.8 120.2 85.5









Computerworld Stock Trading Summary

	52 WEEK	OLOGE CLOSE	WEEK	were
	RIME (I)	OCT, 12 1988	CHANGE	PCT
Communications	and Ne	twork S	Servic	es
AMERICAN MPO TEDAS COMP ANDREW COMP ARTEL COMMISSION	100 74	93.75 16.25 1.76	0.4 0.5 0.5	110
AVAIL SHANTEN INC.	34 20	0.75 5.75	91	-14.3
ARDIN CORP BELL ATLANTIC CORP BELLSOUTH CORP	22 16 80 61 64 29	21.625 72.125 40,75	0.5 0.5	11
COMPTE SUCH LABS INC COMPLITER AS THORN TECH CONTIL COMP	30 25 10 4	1313	80	6.17
SATA SHIFTICH CORP DICYTH, COMMINSSOC SHIMTECH CORP	10 4 41 20 20 14	6.625 22.6 20.25	-1.0	4.
NEMONE INTERNATIONAL INC. INC.	1 1	9.876	-0.1	4
SENSON DEPLOTE THE	4 2	3.875 42.25	-1.6	- 2
TT COMP MA COM INC MC COMMISSION COMP	187	60.375 6.875	00	20
NETWORK EQUIPMENT TECH	25 12	19.0	-0.6	4
HETWORK SYSCORP HOPTHERN TELECONILTO	21 14	.12.5	98	- 1

œ.	66	44	58.125
	Computer	Sv	stems



enc is a "s



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	Sem	icon	duct	ors		

en SCh Lament sec	18		14.35	403	- 12.71
Semi	icon	duct	ors		
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MALOY COMP. MARKET, BIC MAT RESERVED	10	338	2,825 6.5 6.025	61 61 64	45 42 42

ALTO THOS TRONCOMP		8.25 8.373	00 00 04 47 03 28 03 43 03 43 00 08 03 67 03 67	
BANCTEC HC CONVERDATA PRODUCTIC CONVERDATA PRODUCTIC CONVERDATA PRODUCTIS CONVERDATA PRODUCTI		276		
		10,625		
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EASTMAN NODAN DO EMIC COMP MASS	29 39	9.8	58 13 03 A7	
EMALEX CORP EVANS & BUTHERLAND ECOT CORP INTERLEM INC	13 6 4 2 7 34 7 8 38 34 4 4 4 4 4 4 2 7 1 8 2 7 1			
LEE DATA COMP				
		13.8 3.129 7.25 3.108 2.875 2.199		
		8.875		
	11		05 7A 05 7A 01 44 01 48 00 00 04 58 43 36 48 71 05 00	
		8 125 62 125		
PERSONAL COMPLTER				
		1.583 1.5 7.6		
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		5.75 6.126 7.875 1.875		
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Leasin	gC	omp	anies		
CONFIC N ASSOCIATES INTER.	17	7	16.26	3.0	0.0
MAL BIC	32	12	8.75 20.5	0.0	3.5
PENTAL PROSYS PROBETION RELAMETRI NC	17	4	1275	-0.4	11
TERMINE	8	3	4.875	4.4	.F.1

Hitchhiking

DEC stockholders get free ride

The market at large continued to reflect a wait-and-see attitude on investors' parts last week, but they apparently liked what they saw in the technology sector, Digital Equipment Corp.'s announcement of effective price haltes, for example, helped drive the company's stock up 24's points to close

IBM — whose underwhelming 3% profigain and 5% rise in revenue for its recently ended fourth quarter were announced Fridat — enjoyed a similar gain, closing Thursday

Microsoft Corp., picked up 11 wp oposts, rs ing to 51½ after the company hinted that en couraging figures will be on display in it forthooming earnings report for the quarte ended Sept. 30. Measwhile, microcompute rival Lotus Development Corp., still feeling the fallout from further delays of the vannels latest release of its flagship 1-2-3 spread sheet notivener, fell 1½ points to a new low of

Spurned suitor Daisy Systems Corp. dropped % of a point to close Thursday at 7% after Cadnetix Corp. rejected its corporate advances; Cadnetix held steady at 8%.

Program trading still a market linchpin

erage when program trading

came a focal point for criti-sm. Sen. John Heinz (R-Pa.) amediately called for the sus-

computer-driven algorithms have driven the market," while a presidential commission faulted

program trading for accelerating

Whipping boy? Others felt the practice was

wrongfully made a scapegoat

ation of stocks for the

on of program trading to "at least temporarily unwind the death spiral into which mindless.

BY JAMES DALY

Program trading. Few phrases ever knifed deeper into the heart of the fincial and investor community han those four syllables did last

When analysts began to sift ough the wreckage of the rket's collapse, many Wall rece a compee, many was reet executives and members Congress blamed program using — a complex computer-ided technique in which large socks of stocks and stock index res are automatically traded in specific market conditions cour — for dumping large mounts of stock after the fall sgan and snowballing a bad sit-ation into a disaster.

blaming itters about the econo-my, high interest rates, changes in tax legislation and a worldwide In the past year, program eding has weathered the sling ed arrows of its critics, and although recent reports by the New York Stock Exchange indi-cate that the practice has slowed

A report prepared by the NYSE last December even noted "merely trading simultaneously a number of stocks, over the past year, it remains a
vital part of financial trading.

But emotional scars remain;
most investment-house representatives seem most comfortable discussing program trading which is the essence of program trading, can hardly be the cause of whatever problem may exist; nor should we be troubled by the fact that in the last two deca of the 20th century particular

trades are selected by the use of a computer."

Many brokers — including in whispers.

The smoke had barely cleared on Oct. 19's historic 508-point drop in the Dow Jones Industrial

the top three program traders, Morgan Stanley & Co., Bear Stearns & Co. and Merrill Lynch Research — refused to disc their level of program tradi

Get with the program

More than 20% of the stock sales on October 19, 1987 were generally the New York Stock Exchange's Designated Order Turneround (DOT) program trading system

Bet a series of monthly re ports on program trading issue by the NYSE indicate that enth

masm for the practice may be cooling. Program trading in Au-gust dipped to 8.1% of the Big Board's average trading volume

billion shares a day.

based in part on reco

for instance, halt trading on the NYSE for one hour if the Dow Jones industrial average falls

of 144.7 million shares a day, ac-cording to the report, down from a level observers placed at 15%

to 20% a year ago. Still, the NYSE is not about to take chances. Earlier this year, the exchange fistened to the cries of nervous investors who claimed that computers could increase volatility in a falling mar-ket; the Big Board has now in-stalled a collar that prohibits certain forms of computer-as-nieted trading activity on days when the Dow falls by more than

50 points.

But many more basic problems still exist. According to a
recent report, "Computers in Financial Trading," issued by Estevier Advanced Technology Publications in New York, many
commentators who attacked program trading for having con-tributed to the volatility of the U.S. stock markets were not even certain what they were at-

even certain what they were at-tacking.

Author James Essinger stated that financial traders usually in-terpret the term as involving a portfolio, or program, of that, with computers only being used to keep a record of the progress of the sale. In contrast, the NYSE includes both computers assisted index arbitrage and portfolio insurance-trading strateasjes under the program-

Black Monday FROM PAGE 1



flow. To fight back, the Tandem Computers, Inc. hardware used in the exchange's limit order sys-tem has been upgraded to run 50% faster; now it is able to handle 600 million shares in a day, vs. 450 million a year ago. To counteract the problem of

communicating information to its member firms, the NYSE has ade capacity improvements to common message switch, ch is the system that interfaces to the exchange a security brokerage member firms. 'We've increased the capaci

ty from a peak 95 message rates per second to 120, and we're go-ing up to 140 by the end of the year," said Geri DiCostanzo, Se-curities Industry Automation Corp.'s senior vice-president for the NYSE trading systems de-velopment and operations.

In addition, the NYSE has

nitted another \$200 million

for the next five years, and an Operations Advisory Commit-tee, to be overseen by NYSE. President Richard Grasso, will ordinate an industrywide sys-

The exchanges, however, were not the only culprits of the disruption on Wall Street during the week of Oct. 19. While there were problems communicating the trading information to mem-ber firms, those firms often had their own problems handling the

nts of information

ev received "One of the reasons the trading hours were curtailed briefly following the 19th was that the member firms simply had such a backlog of trading information paperwork," said Linda Cole-man, executive vice-president of planning and development at the Boston Stock Exchange and a former NYSE vice-president.

Boosting systems Many of those member firms have nince upgraded their systems. Walter Requet, semior vice-president of marketing and new products at over-the-coun-

ter trading firm Herzog, Heine, Geduld, Inc. in New York, said his company's volume jumped to about 18,000 trades Oct. 19 from 8,000 the previous Friday. Normally, we would handle 20,000 to 30,000 ticks (stock price changes] a day," Raquet said, "but we had 30,000 ticks in the first 20 minutes" of Oct. 19 and the systems got bogged

down, be said. Now, the firm's software has been repro-grammed to handle greater throughput, so "if we got 30,000 ticks in 15 minutes, we could handle it."

Tandem, whose fault-tolerant systems are widely used by securities firms, has seen sales to those companies climb 30% this year, said Ray Villareal, securi-

The exchanges have also put a number of procedural changes into effect to ensure that bottle-necks will not wreak havoc on the exchange floor again. Among them are the following: leted upgrades to hardware and improvements in soft-ware at many of the domestic ex-

changes, as well as planned future upgrades. The NYSE's goal is to manage a volume of 600 million shares a day as monothly and efficiently as it already processes its daily volume of 200 million shares. By the end 200 million shares as early as late next year, the NYSE hopes to have the ability to handle one hillion shares as as and the same and the same as the sa Now, 1,500 stocks are hand through 400 books, compa-with the 215 books handling 4

stocks the day of the crash.

The initiatives and regula-tions are also intended to bring better communications among the domestic markets. An inter-exchange hot line has been es-tablished for the NYSE, the American Stock Exchange. American Stock Enumage, CME and the Chicago Board of Trade for communication and coordination during a crisis. Oth-ers will likely participate.

ers will likely participate.

"Telephone lines have been
set up between the exchanges
both at the chairman level and on
the trading-floor level to keep
immediate communications. commu

More controls
"There really weren't enough
circuit breakers built into the
system," said Jim Eckler, vicecontingent on option by all of the

and Securities and president of information systems and strategic planning at Mor-gan, Keegan & Co., a Memphis-based brokerage firm. "The regand Securities and Exchange Commis-sion approval, which is expected to take place this week. • A 20% expansion story agencies are only now oving more policy controls into ce to prevent a stock panic." Coleman said the Boston Ex-

perwork on the NYSE floor by in-creasing the number of electronic display books. The books fa-cilitate the record-

change is committed to the ini-tiatives put forth by the NYSE and CME and would likely abide by them if the situation warrantby them if the situation warrant-ed it prior to the SEC approval.

The Presidential Tank Force
on Market Mechanisms, also
known as the Brady Commis-sion, found that a primary cause

Feds supply more studies than ideas

BY MITCH BETTS

WASHINGTON, D.C. - The October 1987 stock market crash spawned a presidential commission, four major studies, several congressional hearings and a few frenzied calls for the nsion of program trading.

actions to prevent a recurrence of Black Monday is quite short. actions to prevent a recurrence of Black Mooday is quite short.

"In terms of legislation, i'rs really been a bust," said Julie Sedky, a political analyst at Washington Analysis Corp., a scuritties research firm. "Congress didn't know what to do with all of the conflicting advice that it got . . . so it didn't do any-

Indeed, the studies, agencies and exchanges rarely agreed on what caused the volatility on Black Monday or how to fix it. For example, the Presidential Task Force on Market Mechaanns — chaired by Secretary of e Treasury Nicholas Brady and sown as the Brady Commission and the Securities and Exprogram trading was the culprit, but the Commodity Futures Trading Commission (CFTC)

The Brady hunch In the regulatory field, the Brady Commission urged the Federal Reserve Board to become a superregulatory agency, the SEC chairman sought to wrest con-trol over stock-index trading from the CFTC and the CFTC

from the CFTC and the CFTC opposed both proposals.

Lacking any consensus in the executive branch. Congress put the issue off until next year, when a new administration is likely to have more enthusiasm.

Sedky explained.

There has been virtually no change in the federal government's regulatory structure, as the Brady Commission recommended, to better coordinate

The commission said a single ency must have authority to tor and resolve intermarket esss in order to "reduce the

and to deal effectively with such pissodes should they occur."

Edward I. O'Brien, president feb Securities Industry Asso-tation in New York, said that overnment inaction is contrib-ting to the low level of investor onfidence in the stock market leaving most trading in leaving most trading in and of professional and institu-

ere still isn't a process in

process of the proces

points or more in a single way of if the futures market dropped in a similar fashion. The plan would

ocurities industry director at ratus Computer, Inc. For instance, Smith said there could be an increase in the use of multinational brokerage houses and multinational links to houses and multinational links to make trades between countries. He also predicted that there will be more desire to access and trade foreign securities, with more U.S.-based investors seek-

ng to buy securities in Japan, ing to buy accurates in Japan, Britain and other countries as trade regulations ease up. The computer systems will play a ma-jor role in tracking trading beha-viors and keeping the trading process smooth.

More is leas?
The ability to access more stocks and issadic more trading world-wide as the systems and into are improved, however, should not mean that another market drop would bring even more problems, caustioned former NYSE Chief Economist Roger Robert Roger Schemer and the control of the stock of the control of the system of the control of the system of the control of the stock of the control of the system of the control of the control of the system of the control of the control of the system of the control of t orders transmitted doesn't mean there will be big price effects," be said. In fact, be added, with less chance for bottlenecks, both buyers and sellers will have accu-rate information, which would be more likely to keep the market in

check.
With the NYSE inundated
with trading on Black Monday,
the fact that the regional exchanges made it through that
date relatively unscathed has
been largely overlooked. The re-

also require an additional two-hour trading balt if the Dow fell another 150 points.

The National Association of Se-curities Dealers (NASD) said it

curities Dealers (NASD) said it to opposes marketwide circuit breakers but reluctantly agreed to go along with the plan at the request of the SEC.

NASD, which runs the over-the-counter stock market, believes that circuit breakers will increase market volatikly instead of curbing it.

Supporters arrused that mar-

Supporters argued that mar-ketwide trading halts are neces-sary because the stock and fu-tures markets are interrelated.

If one market breaks down, the said, that transmits intense se ine pressure to the markets th

SEC apokeswoman mary McCue said several steps have

McCue said several steps have been taken to prevent a recur-rence of Black Monday. One is that a pilot program has been ap-proved for cross-margining of stock options and futures pos-tions by professional trading firms. This is intended to add fidity to U.S. fa

Also, telephone hot lines be-tween the stock, futures and op-tions markets have been estab-lished to share information such

Tech stocks on ropes

ince knocking the computer industry to the ground last Oct, 19, the stock market has continued to kick sand in

An one nanotang the computer solution to the ground last for the computer solution to the and in the fact for the computer solution to the and in the fact for the computer solution to the computer solution the computer solution to the computer so

way time what a shout macroeconomic conditions, which has abated little since the crash, has translated into swestor doubt about corporate spending for computers. Add in other uncer-tainties about the future of Unix, OS/2 and IBM's Micro Chan-

triantes about the future of Unix, OS/2 and IBM* Micro Cham-hardhacture, and inventors get downight catatonic.

"It's pretty simple," said Mary McCaffrey, a computer industry snaysh at Cyrus J. Lawrence, Inc. "Everybody hates them, and no one wants to own them. Institutional fund managers are very near-term performance oriented because that's how they're evaluated. They just kick [inchnology stocks] out

Comeback falls short
Major computer stocks have failed to reach their precrash

IBM	135	103%	117%
DEC	172%	130	90%
Microsoft	641/2	4514	. 50%
Lotus	3214	264	15%
Apple	4814	363/4	38%
Compaq	6214	4914	52
Unisys	38	301/2	31%
Computer Associates	2814	21%	28%
			CW CHAI



ITH THE firm's upgraded system,
"If we got 30,000 ticks in 15 minutes, we could handle it."

WALTER RAQUET HERZOG, HEINE, GEDULD

noon, portfolio insurers had, the Brady Report said, "contributed over \$3.7 billion in selling presading. On Oct. 19, arbi and straight-sell programs trig-gered \$4 billion in sales — 20% of the sales on the first 600-mil-

Indeed, most exchange com-uter systems did have trouble lion-share day in the NYSE's hishandling the volume. The NYSE's SIAC system, compris-ing 200 Tandem CPUs, lost two processors under the strain tory.

The commission report, filed in January, identified widespread selling pressures on the CME's commofities market as the start of the side. Within hours, indeed arbitrage traders had placed \$1.7 billion worth of program sales through the NYSE's Designated Order Threatound \$2.3 billion in but the fault-tolerant system kept going. At times, the Pacific Stock Exchange's front-end pro-Stock Exchange's front-end pro-cessors stopped functioning alto-gether, halting trading for sever-al hours. Everywhere, high I/O rates slowed the display of what was happening in real time on the exchange trading floors. The fact that the workfwide stock markets are linked elec-tronically did not contribute sig-mificantly to the workfwide restraight program sales, much of it from portfolio insurance ac-

counts, was triggered by the prospect of deep discounts offered by the risk arbitrageurs.
From noon to 2 p.m., the Dow
Jones industrial average fell from
2,140 to 1,950, with the last 100 nificantly to the worldwide recould become more important in the near future, according to points of the decline triggered by reports that the NYSE might Mark Smith, former vice-presi-dent of technology at the Amerider the pressure of highme trading. By early after-

The daily acid test

NYSE floor puts systems through their baces

NEW YORK - The floor of the NEW YURK — I no moor of the nation's largest stock exchange is a constant proving ground for the computer systems that are designed to keep it running with-out a hitch.

There is testing going on and here virtually the first and second shift of every single day of the week, on most Saturdays and occasionally on Sun-days," said Geri DiCostanzo, the Securities Industry Automation Corp. (SIAC) senior vice-presi nt in charge of New York ock Exchange trading systems pment and ope

Aside from the routine dis nostic and quality assurance tests on the Tandem Computers, Inc. and Stratus Computer, Inc.

major software releases, tests are performed that involve NYSE workers as well as the floor of the exchange, DiCos-

Occasionally, there are the tests that put the NYSE's sys-tems into the public eye. After last year's unprecedented mar-ket break in October, which slowed the systems at the ex-change, the NYSE is trying to regain investor confidence by con-ducting periodic simulations to emonstrate that upgrades to its estems will let the exchange ef-ciently handle another Oct. 19.

Unprecedented traffic The simulation testing in itself is not new, however. "We've been doing that for five or seven years on a regular basis," said Richard nt at the NYSE. But because

all of the capacity-planning stud-ies for the exchange, which are based on historical high-day data, showed that the maximu daily share-capacity level would reach 450 million by the end of 1987, tests had not been conducted at the 600-million-share

In the capacity-planning mod-el, no 600 million-plus share days were expected until 1990, Di-

This year's first industry-re lated simulation testing was held on April 30 and involved more than 600 people. "We actually had the whole floor manned with specialist clerk firms, NYSE perand SIAC operations peowitness the feat were the press and officials of the General Ac-counting Office and the Securi-

ties and Exchange Comm The test was con ving the actual data from Oct. and the upgraded systems ran "without any problems whatsoever," DiCostanzo said.

ALANI RYAN

70,000 to 80,000 trades. "We took steps in early 1967 to sugment our capacity, and we're adding even more capacity now." Kraulis is planning to trade out his Digital Equipment Corp. VAX computers for a high-transaction, fault-tolerant system yet to be purchased — or

Spooling up
The Boston Stock Exchange has completed installation of its Stratus-based Beacon system. "The advantage to Beacon is its fault-tolerant hardware and modular design, so the ability for us to add capacity as needed can be done very quickly," Coleman

And the exchange also has a redundant fallback system just in case. Since late last year, the Boston Stock Exchange has increased its nonsutomated capac-ity of about 10 million shares a day to 20 million shares a day. At the American Stock Ex-

range, a new trading room was opened in February that uses touch-screen systems to report the trades. The touch screens "have cut reporting time from 30 seconds to 15 seconds or less to actually record a trade," the spokesman said. Much of the blame for the

downward spiral of the market on Oct. 19 was placed on program trading.
"The book is still out on

whether cogram trading was a cause for the crash," Stratus' Mark Smith said. "Even if you do away with program trading, that ean't do away with the ability of the market to have a very seri-ous correction or crash." After all, there was no technology in use in 1929 except for the tele-

The day MIS will never forget

One year later, the stock market crash continues to haunt MIS de-partments, particularly in the New York area.

portments, particularly in 10-bew Vockstrus.

"I would have it exist how"I would have it exist how"I would have it exist howthe port of the port

and banks in the weeks following Oct. 19 was in the range of 14,000 [CW, Jan. 25]. One MIS job recruiter said it may be as late as the third quar-ter of 1989 before the hiring slowdown in MIS picks up in New York.

According to Lynda Lauren-cin at Robert Half of New York, Inc., the market break left many New York-area MIS profession-als out of work: "This is probably the worst depression I've ever seen in the 15 years I've been in this industry in the city." In the

greater New York area, she esti mated, there are probably more than 500 MIS managers seeking

rw positions.

The result? New York is now buyer's market, Laurencin id. "We have tons of people at a market and a market buyer in the same cally manage." every level, especially manage-ment and senior people," she said. Within New York City alone, Laurencin added, her firm has seen approximately 300 high-level MIS managers look-

Faring even worse, she said, are the MIS consultants. "After the crash, everyone got rid of their consultants first," and many companies are reluctant to hire former consultants to full-time posts, fearing they will go back to consulting if the market rebounds, she said.

In Boston, the stock market

bounds, she said.

In Boston, the stock market crash hit hardest at Fidelity lo-ventments, which haid of 800 employees in February.

Recruiters in the Washing-ton, D.C., and Philadelphin areas reported seeing a flurry of re-numen from New York following Oct. 19, but they said the break is the stock market of into have

MIS hiring at San Francisco area brokerage houses slowed briefly in the weeks after Oct. 19 but has been increasing over the last four or five months, accord-ing to Joe Laudari of The Search ALAN J. RYAN

October 19, 1987

I remember looking out of my office, looking down Wall Street.
Usually by 5:00 or 5:30, that's a very, very busy street. It was the
most errie evening because there was nobedy on the street. Eeryone was just fighting their may through the aftermeth.
Linda Coleman, former vice-president, NYSE

My overwhalming concern was the economy as a whole a what [the crash] would mean to all of the financial insti-tions on Wall Street.

eri DiCostanzo, senior vice-president, Securities Industry Automation Corp.



It was exciting. We would love to see volume tike that again zoon — in a positive light. W. H. Anderson, CIO

It felt like the market was in a free fall. It felt like the world news coming to an end. If the Don had fallen another 500 points, it was the select another pic. Walter Raquet, semior vice-president of marketing

nior vice-president of marketing ets. Herzog, Heine, Geduld, Inc.

As a result of the crash, people have been slower to more their money into equities, and they've been slower to trade. Jim Scoddard, semior vice-president, Fidelity Software Development Co.

By noon, it was clear that we had traded more shares in one day than any day in history, and we had several more hours to

Richard Torrenzano, senior vice-president, NYSE

Higher stakes Most of the New York Stock Exchange's volume and index records have been set in the last 12 months

Volum	e (in shares)	
Baconi day	608,148,710	Oct. 20, 1987
Record week	2,299,584,400	Oct. 28, '87°
Slowest day	31	March 16, 1830
Dow Jones is	odustrial averag	re
Bernel class	2,722.42	Aug. 25, '87
Biggest one-day drop	508 points	Oct. 19, '87
Biggest one-day increase	186.84 points	Oct. 21, '87

SOURCE NEW YORK STOCK EXCHANGE, INC. CW CHART

295 98 points 114,86 points Oct. 23, '87*

June 3, '88°

Black Monday FROM PAGE 143

great weekly drop

rals helped case the NYSE's "One-third of all trades that

occurred on that day occurred away from the NYSE, within the regional systems," the Boston Stock Exchange's Coleman pointed out. "To have the reals come in, step up to the ate and take that overload was a significant factor in the mar-kets sustaining and maintaining emselves over those days.

fiv. it was a lack of tomation that enabled the seton exchange to fare better than some of the other regionals under the load. The exchange led many of the orders man ually and avoided the queuing problems some of the other exnges incurred, Coleman said. The manual system can create cklogs, but not within the sys-

And at the American Stock Exchange, the system limits of 55 million to 60 million shares a day were never reached. "The most we had to deal with during the crash was about 45 million, esman said. Fortunately for the exchange, the software had been upgraded just the

weekend prior to Oct. 19. But those who made it through with few scars have not been resting comfortably. "I use the rule of thumb that the next peak will be 50% higher than the last, said Olaf Kraulis, vice-president of the Toronto Stock Exchange. In Toronto's case, correctly called that

In 1986, Toronto, which han-dies 75% of Canada's stock transactions, logged 25,000 stock trades on its busiest day. ssock traces on its busiest day. The peak for 1987 came Oct. 21: 35,000 trades totalling \$420 million (Canadian) in sales. Krau-lis said be expects the next peak to top 60,000 trades. The Toronto exchange is al-

COMPUTERWORLD

Users get an SNA breather

BY ELISABETH HORWITT

orate information systems gers heaved a sigh of relief nonth as IBM fulfilled its promise to ship comm software that promises to make Systems Network Architecture Systems Network Architecture (SNA) networks easier to man-age and a lot more flexible.

"We got a little impatient iting," said David Siegel, ager of network support at emical Bank.
A lot of IBM host-networking troubles will go away, users said,

now that their companies can in-stall Advanced Communications Facility/Network Control Pro-gram (ACF/NCP) Version 4, Relesse 3, announced by IBM in January, and ACF/VTAM Ver-sion 3, Release 2, announced in ne 1987.

For example, IBM expanded the SNA subarea addressing lim-it from 255 to 65,000 nodes in the nick of time for Sears Com munications Co., which was run ning out of addresses, according to Vice-President Gary Weis.

The long-term beneficiaries IBM's extended addressing

cepability will be firms that im-plement IBM 9370s as depart-mental processors, said David Passmore, a principal at Net-work Strategies, Inc. in Pairfax, Va. Since the 9370 must be addressed as a subsrea unto itself, users that have bundreds of re-mote sites will rapidly exceed the 255-node limit, he added.

One feature of the VTAM and NCP releases that IS managers have been demanding from IBM for years is dynamic reconfigura-tion of routing and path tables on mmunications controllers.

th the older releases, "if we not to fix a problem routing seions from one host to anoth-we have to bring VTAM am on both hosts," Chemical and a life likewish and the likewish and the

wait a week or two for a good time to fix the table because it would disrupt the entire net-work," Siegel added. With the new release, "you just go dy-namically in and make the update

without disrupting any sessions at all, which makes support a at an, watch makes support a whole lot easier." Siegel also praised a VTAM enhancement that allows him to shift ownership of the SNA net-work from one host to another with a single command to NCP.

ting eagerly for this support, ich finally will allow the comment where any intelligent festation can talk to any oth

workstation can talk to any oth-er" without having to go through the host, said Vincent Dellolio, second vice-president of data processing at Travelers. While the enhanced NCP and VTAM releases make SNA poer-to-peer networking feasi-ble, IBM still needs to write

ly catch on among corporate us-ers, said Steven Randesi, co-founder of Saratoga, Calif.-based research firm Gen2 Ventures. research firm Gen2 Ventures. The vendor just announced Dis-tribution Manager, an LU6.2-based application that distrib-utes microcode down to IBM 3174 controllers and should shortly distribute software up-dates to other IBM systems such as the Personal System/2, Ran-

as the retrious systems, the inside the inside.

Travelers received an early copy of the VTAM and NCP releases in February, so it has had plenty of time to try the software out, Delbo's said. "The new VTAM is incredibly stable and

efficient — we expect it to save us \$250,000 a year just in CPU cycles, and we see about a 40% reduction in resources need for logging on and off."

tific," he said. The data entry problem is at

the data entry protein is at least partly addressed by two re-cently announced software pack-ages: IBM's Network Design Aid for MVS and Make's Netool Workbench. Both offerings are said to collect up-to-date net-work routing and node configu-ration data from the network

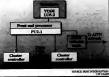
IBM's Design Aid obtains to about Systems Network Architecture network through in-terfaces with BBM's Network Control Program and VTAM ta-bles; Make's Netool Workbench ones, make a netoot workbeach finds out about T1 network con-figurations through the switch vendor's network management system. It also includes a datapase of carrier tariffs, regularly andsted by the vendor. NET will

Since Prodigy uses NET switches, Matters was interest-ed in NET's version of Netool Workbench. However, he ques-

as use outs ne necoos for his de-cision making.

"A primary objective of net-work design is to avoid vulnera-ble routes," Matters said. Still, Matters said that he would in-vestigate Netool Workbench. "That's why I come to the show to look at tools like this."

No host needed New SNA soft



Shortcutting FROM PAGE 1

man mind is hard to replace in terms of looking at contingen-cies and being able to say that if you build a node there, this will pen to your response time, said. Users who have tried older

simulation packages ned that it takes too time to come up with the plete and current informaed to ensure accurate

Tom McDonald, principal consultant at MGT Technology Group in Natick, Mass., recently

from Connection Telecommuni-cations, Inc., to do capacity plan-ning for a major public network project. While praising the pack-age a response-time analysis, McDonald complained about the amount of data entry it required. "I couldn't even ask it to copy

nformation about one site nother, similar site," be

problem connected with net-work simulation at Avon Prod-ucts, Inc., according to Philip Co-laluca, a network project leader at Avon. His staff has been inves-tigating the modeling capabiti-

Transmission Manager, a Per-sonal System/2-based system for NET switches. for NET switches. "Yon can do network plan-ning scenarios such as, 'I' I route all my traffic through Chicago, how will it impact New York traf-fic?" Colaises said. Avon also uses Mind, a network simulation package developed by Contel

Corp.

No matter what package is used, however, "you only get input as good as you put in," Collicus said. His people tend to add more bandwidth than their simu-"because we'd rather have too much than too little. But when you allow that margin for error,

Bright spot in IBM earnings

BY CLINTON WILDER

ARMONK, N.Y. - IBM last week reported only meager growth in sales and earnings for the third quarter ended Sept. 30, but analysts were quick to see a silver lining — much of it due to

Considering that the three-month period was a sujor transi-tion in the IBM product line at both the high end and in the mid-range, IBM's revenue growth of just 5% was considered ade-

put most encouraging was an estimated 20% growth in orders placed by IBM's U.S. customers during the quarter, according to mainframe analyst Michael Geran at Nikko Securities in New York

"In terms of future results, we finally have evidence of a turn in orders in the U.S. and contin-

Lete sturrer
With shipments of its AS/400
and 3090 S models not beginning until inte in the third quarter, the quarterly results respot
only a small benefit from those

products.

However, overall IBM shi ments were ahead of year-ear er levels for the seventh conse utive quarter, IBM Chairm John Akers said in a prepar Overall, IBM earned \$1.25

billion in the quarter, a 3% in-crease over year-earlier profits of \$1.21 billion. The organization's earnings per share came in at the high end of Wall Street an alysts' prediction ranges at \$2.10, compared with \$2 per

\$2.10, compared with \$2 per share a year earlier.
According to IBM, daring the first nine months of 1988, its profits were 9% ahead of 1987; but that was mainly attributable to a lower effective tax rate. Pre-tax earnings, which grew 5% in the third quarter, were still 3% below 1987 levels for the nine-month pariety.

month period.

Third-quarter revenue creased 5% to \$13.4 billion creased 5% to \$13.4 billion. compared with \$12.73 billion in the year-earlier period. Nine-month sales of \$38.74 billion were 7% higher than in the first nine months of 1967. In a product line breakdown,

third-quarter revenue from sys-tems sales increased 7%, and

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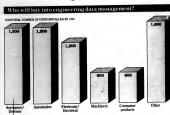






TRENDS

Engineering



omputer-aided design (CAD) technology revo-lutionized manufactur-ing, but with it came a new set of problems: how amage all those computer-rated drawings and models. new class of software, A new class of software, dabbed computer-integrated product and program information management (CIP/PIM) by Cimdata, Inc. in Welleuley, Mass., manages the information on a product from engineering through manufacturing it tracks various data related to a product, such as drawings and revisions, throughout the product resole.

revisions, throughout the product cycle.

Not surprisingly, the aerospace and automotive industries will make up the largest users of this CAD management software, according to Candata. Companies in these industries are the heaviest users of CAD and have

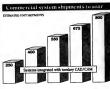
the most complex systems.

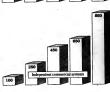
Packaged systems for track-ing CAD documents are fast recing homegrown engineering

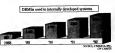
placing homegrown engineering data management systems. Vendors of these products in-clude such beavyweights as IBM, Digital Equipment Corp. and Prime Computer, Inc. as well as the emerging class of spe-cialized vendors such as Sherpa

While the product implemen-tations can take many forms, most integrate database manmost integrate database man-agement systems as a core jecc-of the software. Relational tech-nology lends itself well to the task of establishing and tracking relationships between the vari-ous elements of a drawing and relating them to other areas.

AMY CORTESE







I N E S I N S I D

Get good and SCSI. DEC is expected to add two new models in its histories line Wednesday. According to a concretion to his program, between the Microws II and Microws 3500 and 3000. The revent annahers of the lam-y will run on the 2-4-MITS CVM, processor and will be public, Diff. at expected to introduce a new mea-strangs in tracting for the Microwstee Gold DES. One core called the interface DEC's propertiesty implementation of the study statement of the contract of the con-clusive statement of the counterpress of the DES. On the decision of the Microwstee Section 1.

For the techle on your Christman line. For one, it feel the techle on your Christman line. For one, it feel the west, we that the CSJ Presentation Minager (Mark Panne line Mark Van exhibated to slight be very last adapting CSL 31, with a major envening by Illiad that day and the control of the control of

port for monators and other prospectrum.

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Past . . . Wanna bury a plug-compatible manufacture? Two strikes and you're out. National Semiconductor may be fed up with the last couple of quarter's poor enrisings. Fr National Advanced Systems. It is past a runner, but financial types are saying that National Semi may put NAS on the block.

Maybe sildes of Jim Mansi's vacation? It seems the executives who arranged Lotus' recost, hashly call prese conference to explain away the latest in what seems be a terminal series of delays concerning the near release Lotus 1-2-3 forgot to sound the sharm internally. Some or in the Boston area are no doubt chacking over notic they received from Lotus late vested defring them to chance to sign up for scheduled demos of Release 3.0. To question is, what is Lotus planning to show them?

What if — we use a modern? Univys subinitary Time-plex cisions that it plans to make its Link/Design network simulation service available as user software at an undi-closed future date. Users wisting a Timeplex nation office can also what if games to determine which configuration of Ti-

New and loading in New York: At last week's Info '3 show, you could question flows the states and view full-color days and the states of the states and view full-color the York (York Commontal Carlo Sarkers); (CSF Astroneck Edition (amounted in April '37) and Persentation Message (amounted in April '37). For cost 19 year and on one them yet, And they movider they for a full-color to them yet, And they movider they for a full-color the yet, And they movider they for the property of the year of the state of the state of the property of the year of the state of the state of the year of the 373-3700 and ash to pools to Editor Bill Laborts, thing at for accelerating warm nonger brute Partial Mai year.

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